THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

Do your trucks lead a double life?

If your trucks have a double function—operation on and off the highway—it will pay you to look into the big advantages offered by B Series Macks . . . the first completely new line of heavy-duty trucks offered by any manufacturer since World War II.

You'll find models—four or six-wheelers—specifically designed for versatile, dependable performance on the roughest of excavation and construction sites, or in highway hauling.

Here are some of the features that operators tell us they like about these great new Macks:

Famous Mack truck engines, gasoline or diesel, that offer lower fuel costs and increased usable power. High-alloy steel frames—2½ times stronger than carbon steel—and big strong axles give ample load ability. Wider front axles give better maneuverability. Ideal gear ratios meet all conditions. New Mack cab with "Unitized" structure and many improvements in comfort keeps drivers happy.

Mack TRUCKS

WHEREVER YOU SEE TOUGH JOBS
. . . THERE IS WHERE YOU SEE MACKS

Mack Trucks, Empire State Building, New York 1, N. Y.
Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Mack B-61S—six-wheel dump truck owned by The Turner Co. of Devon, Conn., distributors of washed sand and gravel, loam and fill.

2206

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

After two million tons, a new job for this cord belt

THAT's just one section of the 3300-foot conveyor system on the Folsom Dam project. A series of belts, like a bucket brigade, deliver 550 tons of aggregate an hour from bunkers across a river to the cement batch plant you see in the background.

In choosing the belts, engineers knew the ordinary type could not handle the entire job because of the sharp 139-foot lift up to the screening tower. They needed a belt that was strong, yet flexible for the long, steep climb, so a B. F. Goodrich *cord* belt was selected.

This B. F. Goodrich belt is made of plies of parallel cords that run lengthwise. Each cord is completely surrounded by rubber—no cross threads tie them together. The parallel cords supply the extra strength, yet are flexible so that troughing is natural, belt keeps centered on idlers, spillage is held to a minimum.

And because of the cord belt's ability to withstand impacts, cutting, and heavy loads, the belt in the picture is expected to carry the 2,000,000 tons needed here, and then be moved to another construction site for many more years of useful service.

Your B. F. Goodrich distributor can tell and show you why BFG cord belts are able to give you this kind of service consistently (not just once in a while) in quarries, ore mines, and on construction jobs where severe operating conditions require the best and most modern conveyor belt construction for the most dependable, economical performance. *The B. F. Goodrich Company, Dept. M-182, Akron 18, Ohio.*

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION

ROCK PRODUCTS

FEBRUARY, 1954 — THE INDUSTRY'S RECOGNIZED AUTHORITY — VOL. 57, No. 2

Bror Nordberg
Editor

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Editorial Consultant

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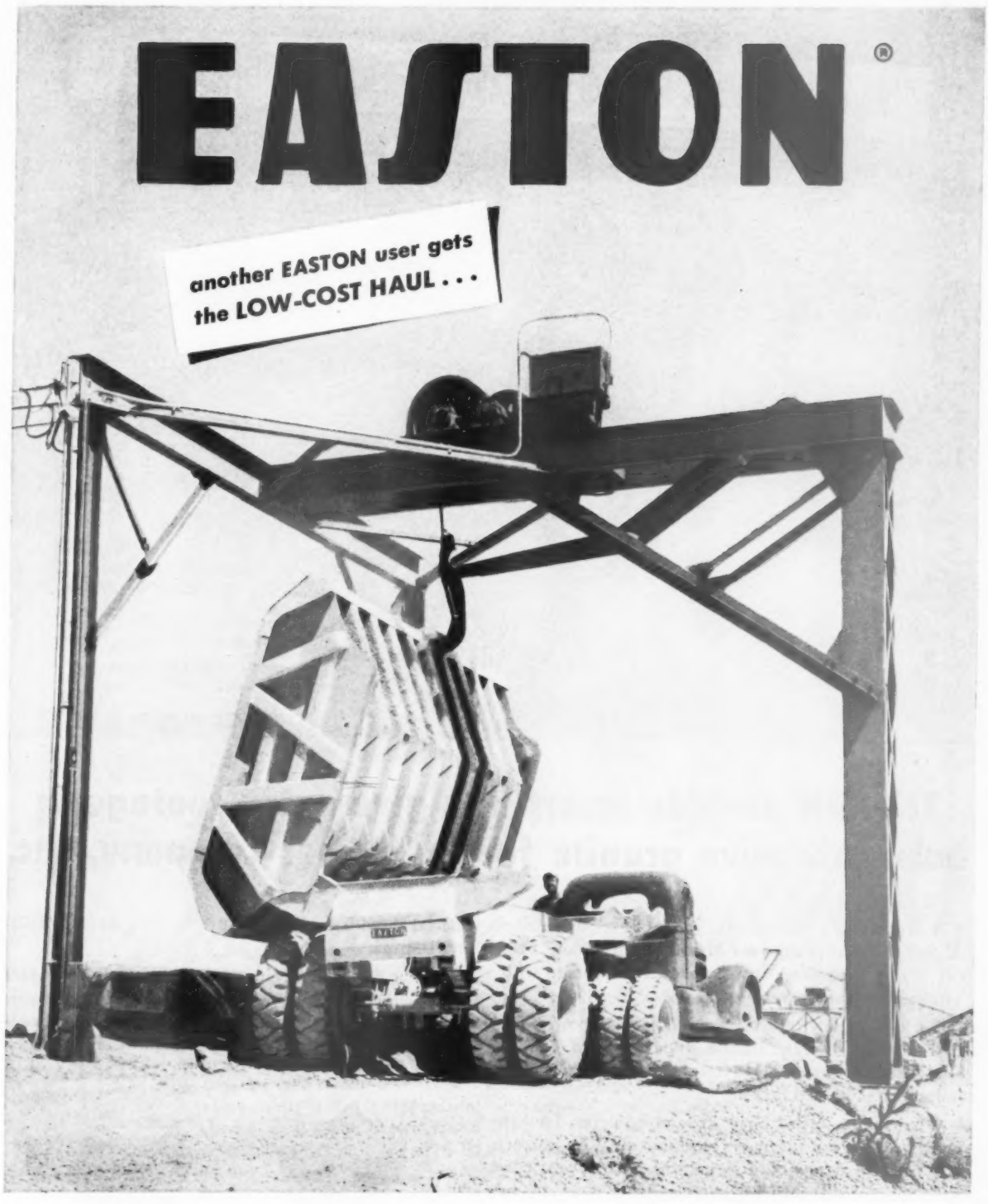
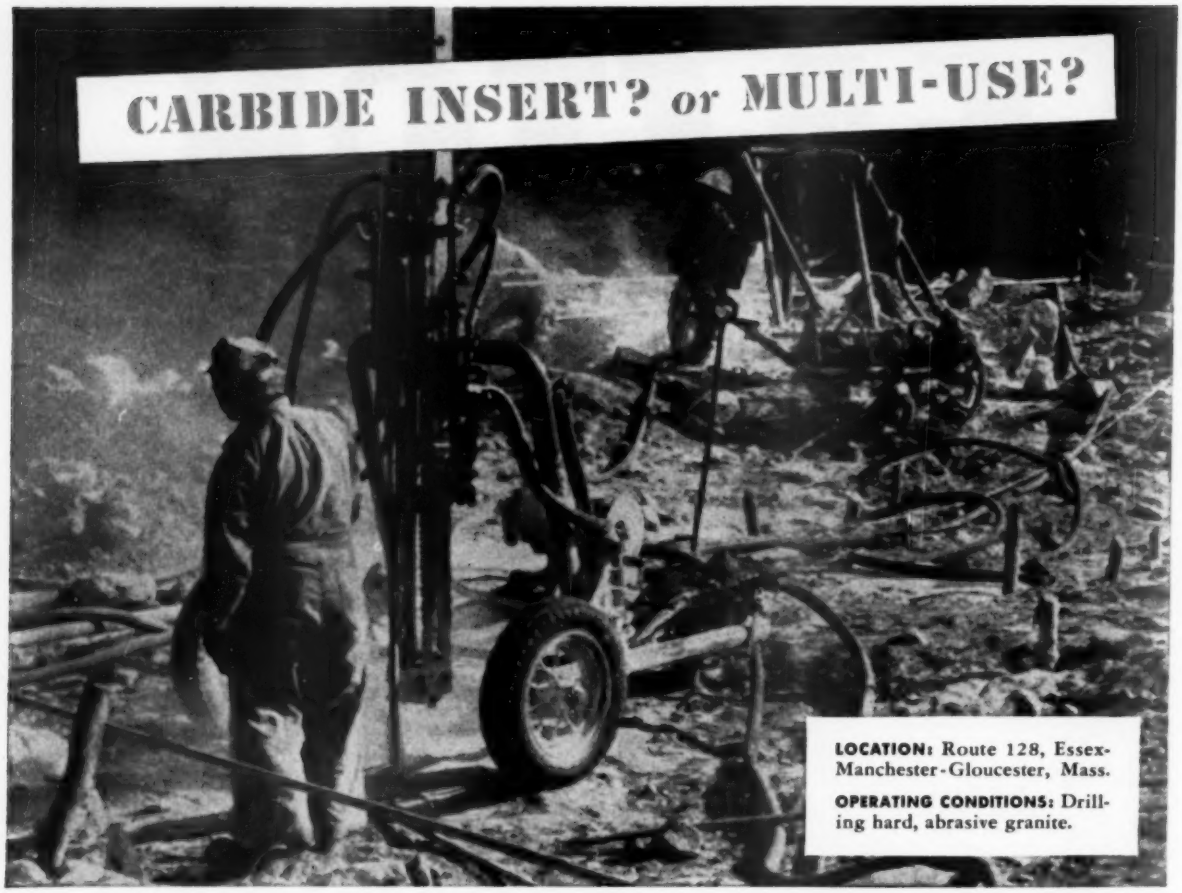


Easton TP Trailer — The standard EASTON pan-type trailer. Capacities from 14 to 20 tons. Used singly or in combination. Standard EASTON axle and fifth wheel. Durable doorless construction — no hoist or other moving parts. Works with the truck or tractor of your choice. The same bodies may also be truck-mounted. Built for the *low-cost haul* in mines and quarries.

Easton HE-20 Hoist — The standard EASTON electric overhead hoist for EASTON TP trailers and BP bodies. Visible stop-and-hold feed. Remote push-button control. Operated by the crusher attendant. Eliminates need for separate unit hoists. Hoist assembly as supplied includes electric winch, A-frame and hook, cable, and controls. Job-fitted for low-cost dependability.

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.

B-1060


CARBIDE INSERT? or MULTI-USE?
LOCATION: Route 128, Essex-Manchester-Gloucester, Mass.
OPERATING CONDITIONS: Drilling hard, abrasive granite.

TIMKEN® carbide insert bits give extra footage in hard, abrasive granite for Gil Wyner Company, Inc.

IN excavating 375,000 cubic yards of extremely hard and abrasive granite for Massachusetts Route 128, Gil Wyner Company, Inc. gained extra footage with Timken® carbide insert bits!

Timken carbide insert bits are most economical for highest speed through hard and abrasive ground. They're also best for constant-gage holes, small diameter blast holes and very deep holes.

When it comes to ordinary ground, however, Timken multi-use bits are the most economical. With correct and controlled reconditioning, they give lowest cost per foot of hole when full increments of steel can be drilled.

With *both* Timken carbide insert and multi-use bits, you can solve your drilling problems. Both are interchangeable in each thread series. Many different Timken bits fit the same threaded drill steel. You can switch bits quickly and easily as the ground changes—right on the job!

Both Timken carbide insert and multi-use bits are made from electric furnace Timken fine alloy steel, have special shoulder unions that protect threads from drilling impact.

Let our Rock Bit Engineering Service help you select the best bit for your job—whether carbide insert, multi-use or both. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

your best bet for the best bit ... for <u>every</u> job

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

For the people whose business is ROCK!

The pictures on this page are typical of Northwest Shovels that are repeat orders in the hands of people whose business is Rock. Each one of these companies has tested Northwest machines continuously in their own rock. They have proved Northwest as a Rock Shovel. They have learned the value of the Northwest Dual Independent Crowd—the crowd that utilizes force most other shovels waste. They have found out what it means to have ease of operation without the complications of pumps, valves and other delicate mechanisms. They have seen the smoother operation and freedom from jerks and grabs characteristic of Northwest Uniform Pressure Swing Clutches. They know what the Cushion Clutch means with its ability to eliminate shock overloads before those overloads can do damage to the machinery. In short, they have proved Northwest advantages to be money makers worth having.

Now is the time to plan to be a Northwest Owner. Now is the time to check into and learn about Northwest. Why not talk to a Northwest Man and get the whole story?

NORTHWEST ENGINEERING COMPANY
1514 Field Building • 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

Convertible for any Mining Material Handling or Excavation Problem

FOR POWER
Bituminous of every type for efficient burning in the latest pulverized-fuel installations
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Bituminous coals of exceptional quality for by-product coking
FOR STEAM
Firm-structured Bituminous with high heat values for every steam-plant use
FOR SPACE HEATING
Many varieties of non-clinkering coals ideal for stoker use and hand firing
Always ready to serve you...

with a coal that's exactly right

Name your choice—in "Bituminousland" along the Baltimore & Ohio, we have it! Here Nature has stored a supply of economical heat and energy sufficient to last for centuries.

B&O Bituminous coals exist in wide variety. The mines that produce them are thoroughly mechanized so that costs are kept low, size and quality uniform. Nearness to industrial centers results in low transportation costs, and the ease of storing removes the need for expensive facilities. Furthermore, new methods and equipment have increased the burning value of Bituminous.

ASK OUR MAN! Let him direct you to the best coal for your needs, and explain proper firing methods. You'll be more than pleased at the improved efficiency, economy, and cleanliness of B&O Bituminous.

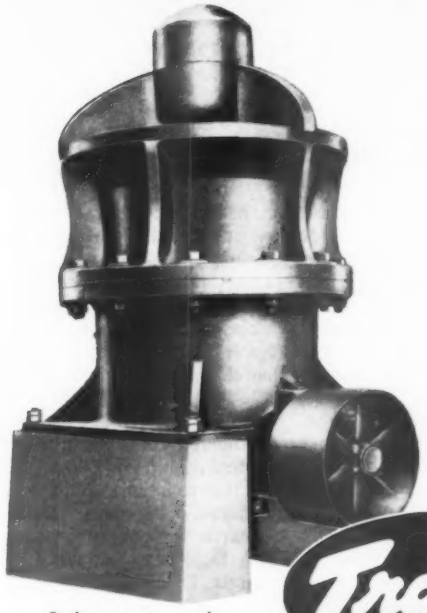
BITUMINOUS COALS FOR EVERY PURPOSE

BALTIMORE & OHIO RAILROAD

Constantly *doing things*—better!

ENGINEERING SIDELIGHTS OF THE ALVA B. ADAMS TUNNEL: *This is the Eastern outlet portal of the world's longest irrigation tunnel . . . part of the Colorado Big-Thompson Project. The 13.1 mile Adams tunnel carries western waters under the Continental Divide for power and irrigation purposes on the Eastern slopes of the Rockies. Work on this project was begun in 1940 when two crews on opposite sides of the mountains started cutting towards each other through the solid rock. Despite difficulties of working in the thin atmosphere 1 1/2 miles above sea level, men and machines made rapid progress. Accuracy and skill of the engineers were proven four years later when the two crews met at a point 3/4 of a mile under the lofty crest of the Rockies. A 25-cent piece would have covered the difference in their courses . . . another tribute to the accuracy and achievement of modern engineering.*

Modern Engineering in Traylor TY Gyratory Crushers Means More Uniform Products at Lower Costs to You



Built in six sizes with feed openings from 3" x 22".

Traylor engineers and producers in the field constantly work toward a common objective . . . more efficient production at lower cost. Traylor TY Gyratory Crushers help you accomplish that objective. The extra large feed opening of Traylor's non-chokable Bell Head handles larger rocks than any other secondary crusher. Traylor's original curved crushing surfaces apply power as a direct crushing force . . . assure a more uniform cubical aggregate on less power per ton. This efficient use of power also reduces wear and replacement costs. See these and other Traylor features in Free Bulletin 7112. Power ratios and capacity data are outlined in detail . . . send for your copy today.

Traylor

TRAYLOR ENGINEERING & MFG. CO.
615 MILL ST., ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
CANADIAN MFRS: Canadian Vickers, Ltd., Montreal, P.Q.

Primary Gyratory Crushers | Rotary Kilns | Secondary Gyratory Crushers | Ball Mills | Jaw Crushers | Apron Feeders

Pinellas Industries, Inc.

Builds new plant around 5 belts reinforced with Du Pont "Cordura"

Reinforced with "Cordura", the belt in foreground (24" x 598 ft.) dumps sand from the central stockpiles onto another reinforced belt (24" x 592 ft.) which carries it to batch bins.

The modern plant of Pinellas Industries, Inc., of St. Petersburg, Florida, is designed and built around a system of five conveyor belts, all sinewed for extra strength with Du Pont Cordura* high tenacity rayon.

The belts carry sand, stone and crushed granite (1) from hopper cars up to a distribution structure, (2) along a shuttle conveyor to central stockpiles, (3) through a tunnel below grade, (4) up to batch bins for ready mix and blocks, and (5) to a fifth belt serving the pipe plant batch bin. Manufactured by the Acme-Hamilton Rubber Company the belts handle moist materials . . . operate in heavy showers and hot sun.

Quarry operators have found that the low stretch strength of "Cordura" permits belts that are stronger, yet thinner and flexible for better troughing and training. Downtime for take-ups is reduced to a minimum.

Before you order your next conveyor belt, be sure to inquire about the use of "Cordura" rayon in belts. We'll send you the names of suppliers... together with full information about "Cordura". Just write for your free copy of "Sinews for Industry". Address: Textile Fibers Dept., Room 2520-R, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

*REG. U. S. PAT. OFF.

Du Pont "Cordura" High Tenacity Rayon

STRENGTH AT LOW COST

Watch "Cavalcade of America" on Television

DU PONT

REG. U. S. PAT. OFF.

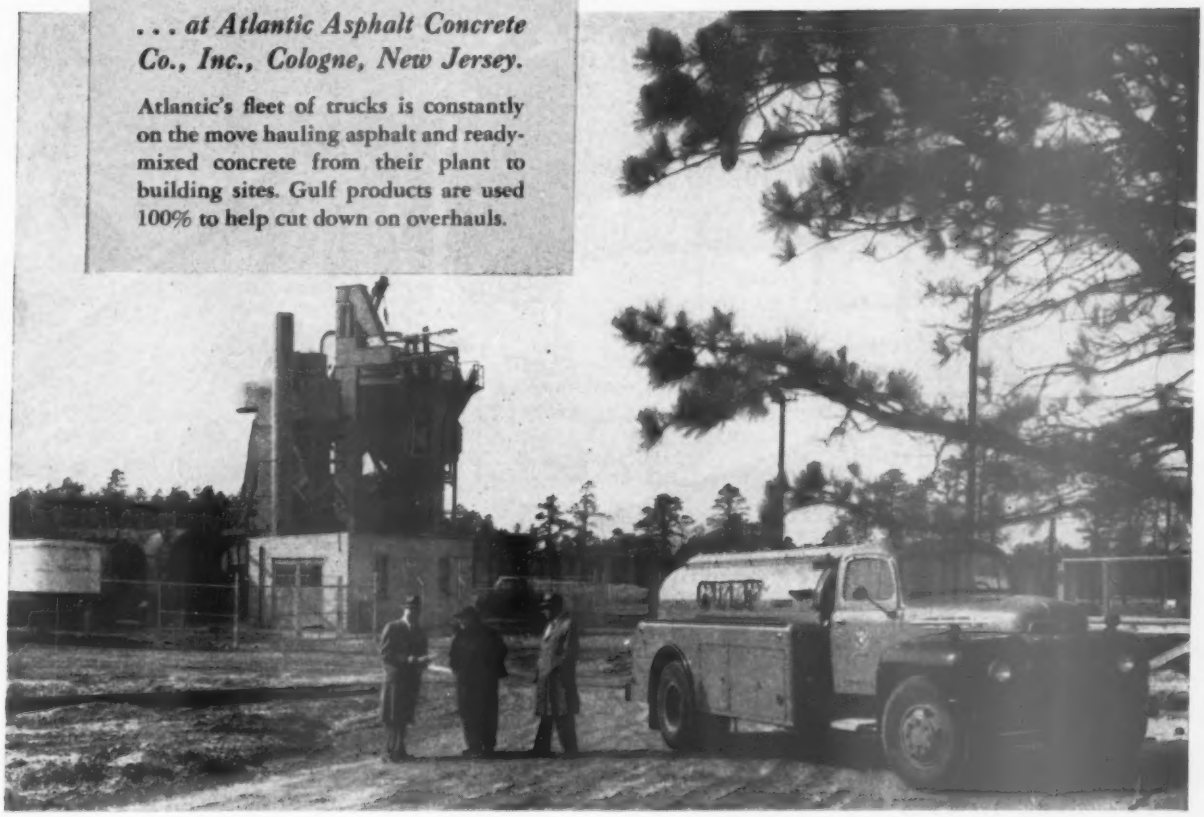
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

more hauls—fewer overhauls

with Gulf Quality Lubricants *and* Fuels

. . . at Atlantic Asphalt Concrete Co., Inc., Cologne, New Jersey.

Atlantic's fleet of trucks is constantly on the move hauling asphalt and ready-mixed concrete from their plant to building sites. Gulf products are used 100% to help cut down on overhauls.



Working as a team, Gulf lubricants and fuels help many companies, such as Atlantic Asphalt Concrete, obtain greater availability of equipment and lower maintenance costs.

Gulf quality motor oils keep rings clean and free and prevent excessive wear—extend mileage between overhauls. Gulf fuels burn evenly and completely with fewer engine deposits.

Gulf lubricants and fuels, as well as Gulf's fine service, are available to you in 31 states from Maine to New Mexico. Give us a chance to prove how Gulf products help you get better and longer service from your equipment. Call your nearest Gulf office now.

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support
Junior
Achievement

Junior Achievement Week
January 31-
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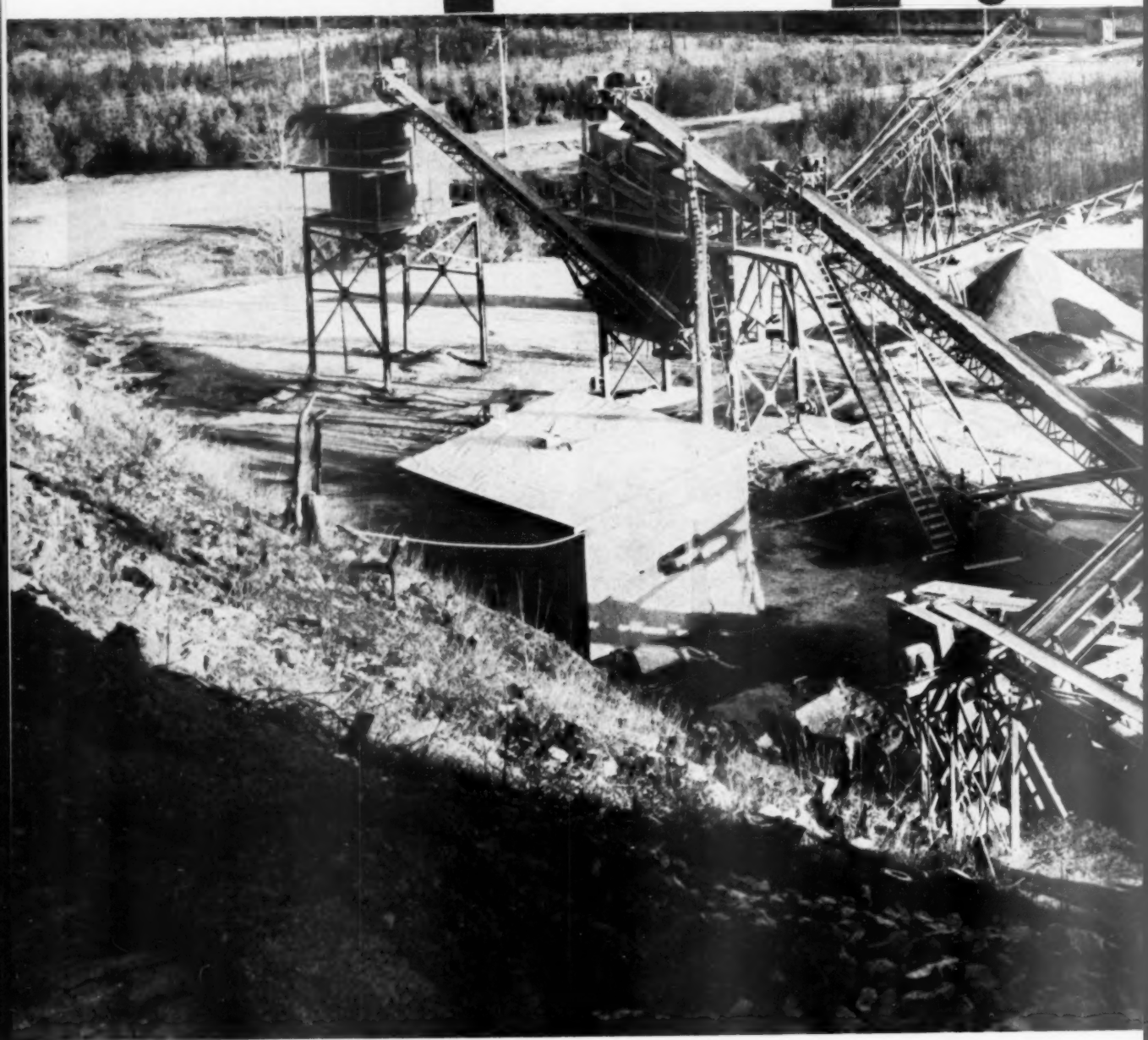
When too much oversize became a problem . . .

that Pioneer Edge



BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

turned it into profit

How General Crushed Stone salvaged a heavy investment with help of Pioneer Portable Plant

Ingenuity is paying off for General Crushed Stone Co. of Easton, Pennsylvania.

When a big demand for ½" minus material developed in its Syracuse, N.Y. territory, GCS remembered it had a large investment in unused 2½" and 3" stone which had accumulated at a number of nearby quarries.

Since long hauls to a reduction crusher wouldn't be profitable, GSC decided to move in an efficient portable plant. The choice: a PIONEER 143S.

In this plant, a 40" x 22" triple roll crusher and 4'x 10' split-feed vibrator provide a 2-stage crusher coupled with 80 sq. ft. of effective screening area. PIONEER conveyors, a 4' x 20' tandem vibrator, and 75 cu. yd. storage bin complete the job.

Shown here as it operates 10 hours a day near Fayetteville, New York, the 143S is reducing large sizes to ½" minus at the rate of 65 tph and to 1" minus at the rate of 100 tons. General Crushed Stone is not only enthusiastic over the exceptional output from hard material, but is also pleased with the cubical product the 143S delivers.

Here is another case in which the PIONEER EDGE is paying off for an experienced producer who has joined his "know-how" with that of PIONEER.

You, too, can make extra profits by using PIONEER *Equipment. For detailed information, write or mail coupon . . . today!*

Have YOU a Crushing or Screening Problem?

An able and experienced engineering staff is at your service. PIONEER specialists with many years' experience will be glad to discuss your difficulties and help you work out a solution. Write to PIONEER today. *You'll be under no obligation.*

PIONEER ENGINEERING WORKS, INC.
1515 Central Avenue • Minneapolis 13, Minnesota
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• Please send me information on the equipment checked.

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☐ ROLL CRUSHERS	☐ WASHING PLANTS	☐ MECHANICAL FEEDERS
☐ ROCK PLANTS	☐ BITUMINOUS PLANTS	☐ VIBRATING SCREENS
☐ ORO FEEDERS	☐ BITUMINOUS PAVERS	☐ CONTINUFLO CONVEYORS

*Name*_____

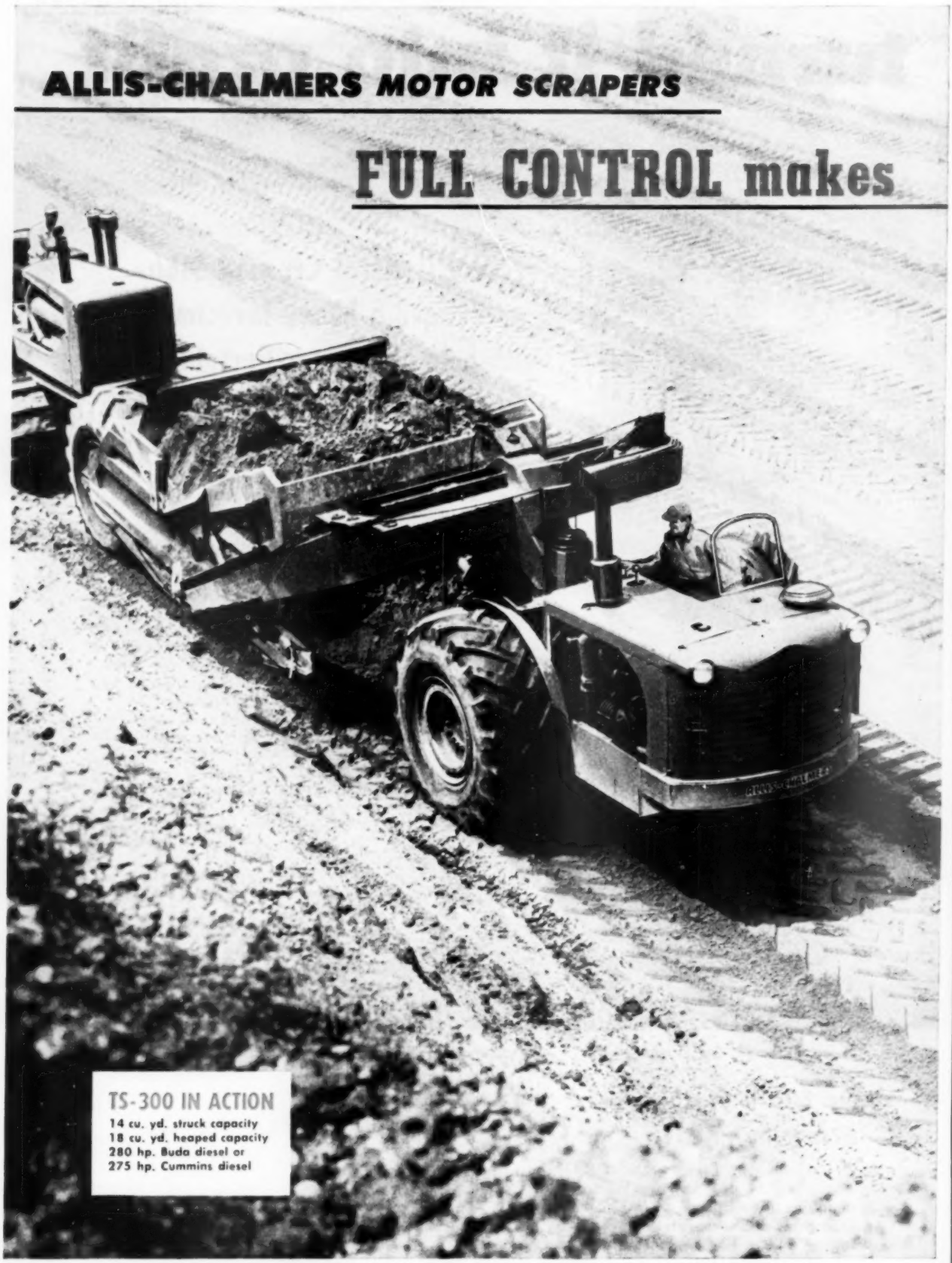
*Company*_____

*Address*_____

*City*_____ *Zone*____ *State*_____

ALLIS-CHALMERS *MOTOR SCRAPERS*

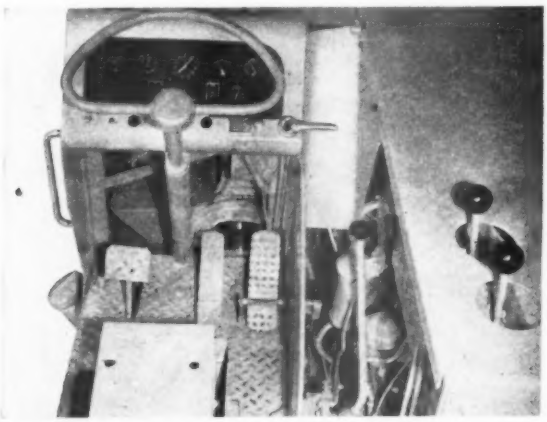
FULL CONTROL makes



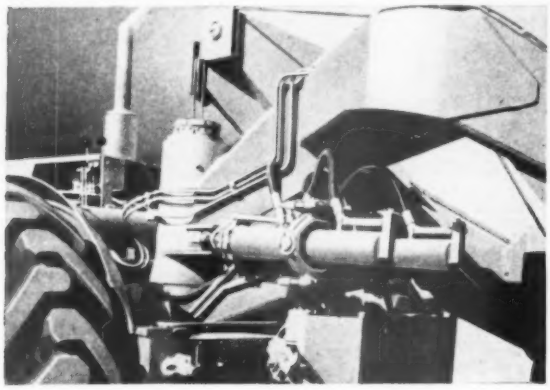
TS-300 IN ACTION
14 cu. yd. struck capacity
18 cu. yd. heaped capacity
280 hp. Buda diesel or
275 hp. Cummins diesel

the difference

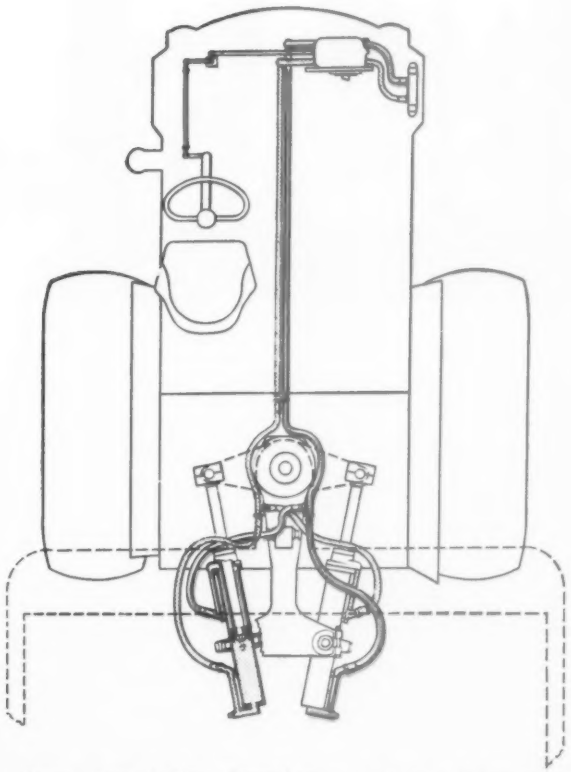
The full control built into Allis-Chalmers *Motor Scrapers* offers you a real advantage. There's no tiring wheel fight for the operator . . . no straining to see what he's doing. What's more, full control creates greater confidence when he's high-balling a full load. He can work at his best all day long easily and safely. That means moving *more* dirt *faster* and at a lower cost.



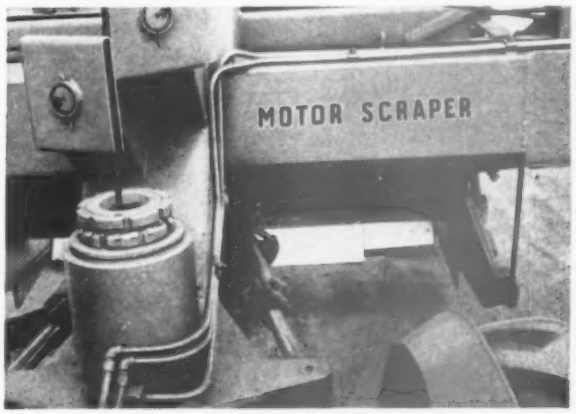
One Hand Does the Steering—the other handles the scraper controls. Fast action makes loading easy. The operator can utilize hydraulic power of steering jacks to pull through soft spots in haulways under extreme conditions.



No Weaving—No Road Shock — Hydraulic system is locked and the *Motor Scraper* becomes a rigid 4-wheel unit except when steering wheel is turned, thus eliminating transmission of road shock to steering wheel. Low-mounted rams, close to load line pull, mean minimum stress on the kingpin.



Easy, Fast-Action Steering — Schematic layout shows simple double-action steering system. Slightest movement of wheel opens valve of gear-type pump; release wheel and valve automatically returns to "hold." Only a one-third turn of steering wheel is necessary for a full swing of the tractor.



Excellent Operator Visibility — Clean design of low gooseneck connection gives operator unequalled view of cutting edge, helps him cut cleanly, efficiently . . . load fast and full.

Your nearby Allis-Chalmers dealer will be glad to show you and give you the full story on these job-proved *Motor Scrapers*. See them at work.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

IDEAS at work...cutting costs!

Progress doesn't come by standing still! And many users of P&H Electric Shovels have learned (to their great benefit) of the strides made to cut costs in all kinds of open pit work.

How has P&H done it? Higher electrical efficiency results from equipment designed and built by P&H specifically for electric digging. Stepless power regulation gives smoother operation with none of the old contactor troubles. P&H Magnetorque* Hoist Drive gives you snappier dipper action—lasts the life of the machine. Air-filtered cab protects all electrical equipment. Independent propel permits faster move-ups. All-welded construction of rolled alloy steels provides the husky strength to withstand years of continuous shock loads.

These and many other advancements, still exclusive with P&H, mean steadier, faster digging. That, in the final analysis, means lower tonnage costs. If that's what you're looking for . . . P&H is your answer.

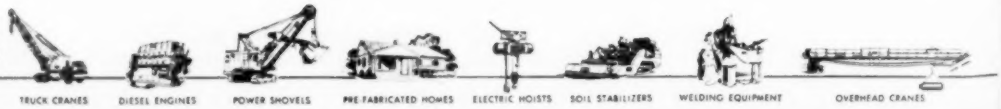
**T. M. of Harnischfeger Corporation for electro-magnetic type coupling.*

P&H LARGE EXCAVATOR DIVISION

HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN

the P&H *Line*

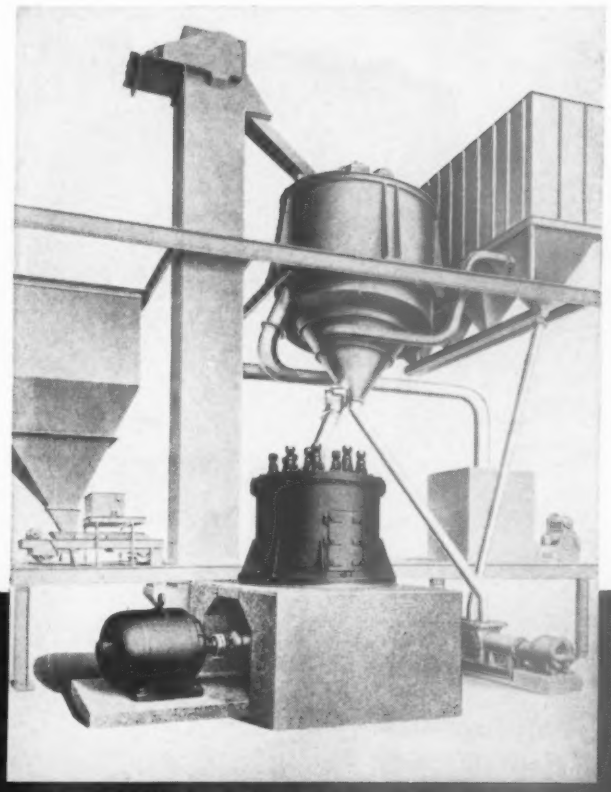


TRUCK CRANES · DIESEL ENGINES · POWER SHOVELS · PRE-FABRICATED HOMES · ELECTRIC HOISTS · SOIL STABILIZERS · WELDING EQUIPMENT · OVERHEAD CRANES

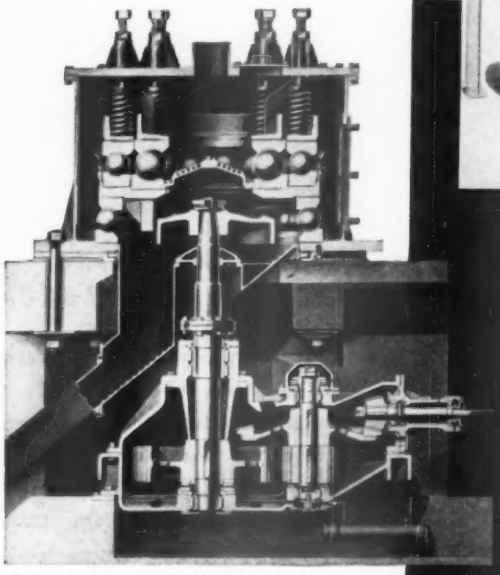
Here's How B&W's Closed-Circuit System

Reduces RAW GRINDING *Costs*

- *No separate drying equipment needed.* Automatic and simultaneous grinding and drying of raw materials is accomplished within the B&W System.
- *Lower fuel costs.* For example, if oil is used to heat drying-air, consumption may be as low as 0.3 gal per ton.
- *Lower power demand.* Ball-and-race principle of grinding used in the B&W Type B Mill operates with an extremely low friction loss, using less power while delivering maximum capacity of product.
- *Less maintenance.* Tough, alloy grinding elements of the B&W Type B Pulverizer are of specially selected steels and heat-treated for maximum wear-resistance, to assure uniform, self-equalizing wear throughout their long life.
- *Far higher capacity in equal space.* Powerful yet compact, the B&W Type B Pulverizer has a high unit output and can replace other types without additional structure.



Typical B&W Closed-Circuit Drying and Grinding System.



Cross-section of a B&W Type B Pulverizer. Heart of the B&W Closed-Circuit System, the Type B Mill is available in sizes suitable to all capacity requirements . . . employs three sets of grinding elements and a free gravity discharge.

It will pay you to get full details of all the cost-saving features of the B&W Closed-Circuit System as they relate to your raw grinding requirements. The Babcock & Wilcox Company, Boiler Div., Process Equipment Dept., 161 East 42nd Street, New York 17, N. Y.

BABCOCK & WILCOX

C-206

MEASURE OUTPUT by "KOEHRING WORK CAPACITY"

With Koehring excavators and cranes you gain an important production advantage in extra work capacity. There are some very simple ways to check this. Take lifting capacities, for instance. The machine with the heaviest lift capacity not only picks up larger crane loads — it also has more stability and power to increase shovel, dragline and clamshell output. Be sure to check lift ratings, and other clear-cut measurements of "KOEHRING WORK CAPACITY" before you buy any excavator or crane. Your Koehring distributor has important figures to show you. See him soon.

K331

lift capacities up to 79½ TONS . . . ½ to 2½ YARDS dipper capacities

BIG-PRODUCTION TEAM — Loading out big-chunk rock, this Koehring 1½-yard shovel is teamed up with Koehring 6-yard Dumptors.® Fast-spotting Dumptors move in close, keep shovel swing short. Square 8 x 8-ft. body permits loading over side or end. No-turn shuttle hauling and instant gravity-dump speed haul cycles.

KOEHRING Company MILWAUKEE 16, WISCONSIN

Subsidiaries: Parsons • Kwik-Mix • Johnson

For Immediate Deposit!

Buell Engineers have made an *exact* science of the recovery of valuable industrial dusts. With the help of Buell equipment, many of America's Leading Corporations make substantial cash savings every day.

Buell's specialized knowledge and experience make possible a scientifically accurate forecast of efficiency and economy before you spend a single penny. You see, Buell specialists study dust content and operating conditions and submit a written report on effectiveness in advance.

We are always glad to supply the names of present users of Buell equipment right in your own field. Their year 'round experience is our best selling point!

Send for our informative Brochure—The Collection and Recovery of Industrial Dusts. It explains *all three* Buell systems of industrial dust collection. Write Dept. 17B today for your complimentary copy. Buell Engineering Company, 70 Pine Street, New York 5, N. Y.

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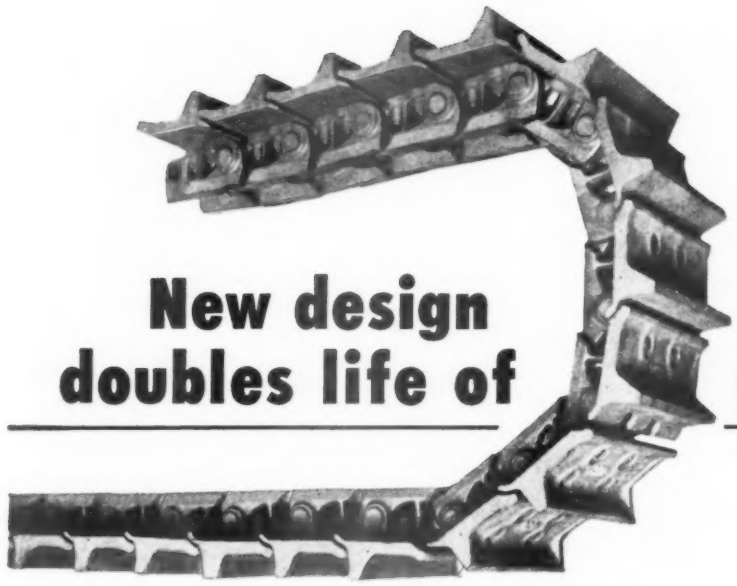
20 Years of Engineered Efficiency in
DUST COLLECTION SYSTEMS



New design doubles life of crawler tracks

KENSINGTON crawler tracks fit all standard crawler tractors

Up on Minnesota's Iron Range, KENSINGTON crawler tracks outlast ordinary ones 2 to 1. Part of this extra wear-ability, achieved under the severest of operating conditions, is due to several design improvements; part of it is the result of the use of wear-resisting alloyed manganese steel.

Here's how KENSINGTON has prolonged track life by design improvements: KENSINGTON tracks have only three parts — the rail, the pin and the grouser. Rails are cast in *one piece* to add strength and prevent wear caused by the constant twisting and weaving found in ordinary tracks. Heat-treated alloy pins are pressed tightly in place under high pressure for further rigidity and near-perfect alignment. Grousers have vulnerable parts heavied-up to reduce bending and breaking.

Yet, in spite of these design changes, KENSINGTON tracks fit all standard crawler-type tractors.

The development of several remarkable wear-resisting alloyed manganese steels, including ORO Supermang and Kenkrome, has also increased the wear-ability of KENSINGTON tracks. These already-hard metals resist wear when subjected to friction, abrasion and shock by constantly renewing their surface hardness. Yet, under this ever-hardening "skin," these metals remain tough and strong. That's why KENSINGTON uses Kenkrome in its rails and ORO Supermang for the grousers.

And that's the one-two of operators who use KENSINGTON tracks — the one-two that enables them to report reduced maintenance costs, longer periods of uninterrupted tractor operation and lower inventory of replacement parts. Further, these operators get increased tractor efficiency and pulling power because the KENSINGTON tracks keep their full "pull-bracing grouser area" for a longer period of time.

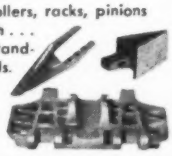
Purchase price of KENSINGTON tracks is only slightly more than that of ordinary ones. But they will save you a lot in repair bills on your tractor. They're shipped in belts from the factory, assembled for easy and quick installation.

Other wear-resisting KENSINGTON replacement parts

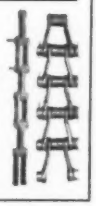
FOR TRACTORS
Kenkrome replacement rims for worn sprockets. Ready to weld on.

CRUSHER PARTS
Jaw plates, roll shells, mantles and bowl liners, hammers, grate bars and liners, etc.

FOR SHOVELS
Treads, rollers, racks, pinions and teeth . . . to fit all standard shovels.



CHAIN AND SPROCKETS
150 standard chains listed in new KENSINGTON Catalog plus many special chains. All of wear-defying Kenkrome.



Mail the coupon for further details on how much KENSINGTON tracks will save you in the "long pull."

SUPERMANG ORO

Kensington STEEL COMPANY

KENSINGTON STEEL CO., Dept. R, 505 Kensington Ave., Chicago 28, Ill.
SUBSIDIARY OF POOR & CO., CHICAGO

Please send information on crawler tracks for tractor described below. I understand I will be under no obligation.

Make of Tractor_____

Model_____ NO. TRACKS PER BELT_____ WIDTH OF GROUSER_____

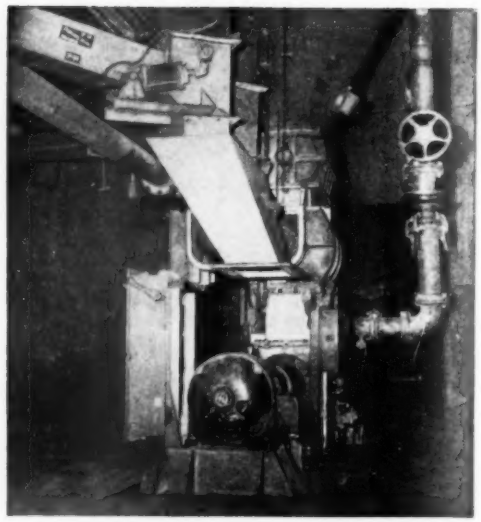
NAME_____

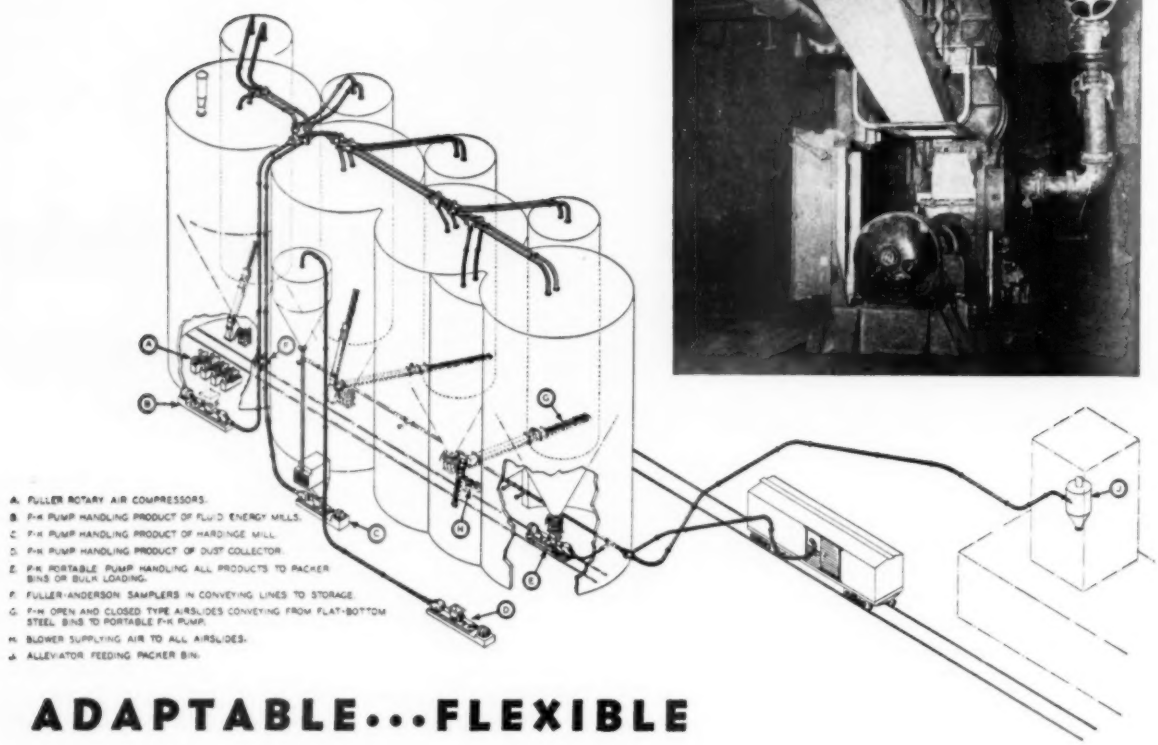
COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Fuller-Kinyon Portable Pump underneath silos. F-H Airslide (upper left) from flat-bottom bin, for delivery to pump.




A. FULLER ROTARY AIR COMPRESSORS.
B. F-H PUMP HANDLING PRODUCT OF FLUID ENERGY MILLS.
C. F-H PUMP HANDLING PRODUCT OF HARDINGE MILL.
D. F-H PUMP HANDLING PRODUCT OF DUST COLLECTOR.
E. F-H PORTABLE PUMP HANDLING ALL PRODUCTS TO PACKER BINS OR BULK LOADING.
F. FULLER-ANDERSON SAMPLERS IN CONVEYING LINES TO STORAGE.
G. F-H OPEN AND CLOSED TYPE AIRSLIDES CONVEYING FROM FLAT-BOTTOM STEEL BINS TO PORTABLE F-K PUMP.
H. BLOWER SUPPLYING AIR TO ALL AIRSLIDES.
J. ALLEVATOR FEEDING PACKER BIN.

ADAPTABLE...FLEXIBLE

FULLER-KINYON and F-H AIRSLIDE® CONVEYING SYSTEM

Conveying of dry pulverized materials in bulk, by air, is the efficient, economical, modern way. Materials such as talc, clays, Portland cement, pulverized coal, fly ash, limestone dust, Fuller's earth, catalysts, can be handled.

Adaptability and flexibility are important features of the Fuller-Kinyon and Airslide Systems. The plant illustrated originally comprised four concrete storage silos, served by a Fuller-Kinyon Portable Pump, operated on a track underneath the silos, for conveying talc to packer bin and bulk-car loading. Later, storage was increased by the addition of five flat-bottom steel bins adjacent to the concrete silos. For economical conveying from these bins, F-H Airslides were installed, to convey to the F-K Portable Pump. Later, for more advantageous packing and loading, the packer bin was moved to a new location. These additions and changes required no major alteration to the Fuller-Kinyon system, merely the extending of the conveying pipe line to the new packing plant location.

Pneumatic conveying systems can be installed without interfering with existing structures or equipment, without interrupting production. May we suggest that you have us make a study of your conveying problems. Our findings and recommendations may give you an entirely new concept of conveying.

Fuller Company is the exclusive manufacturer of air gravity conveyors, except for use in motor vehicles, under Huron Portland Cement Company U. S. Patent Nos. 2,316,814, 2,517,837, 2,527,394, 2,527,455, 2,527,466, 2,527,488 and Patents Pending.

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS • COMPRESSORS AND VACUUM PUMPS FEEDERS AND ASSOCIATED EQUIPMENT

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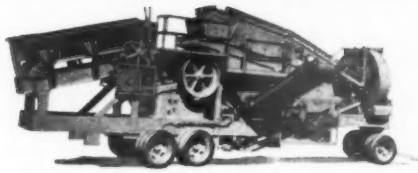
G-78

The UNIVERSAL 293Q TwinDual PACEMAKER



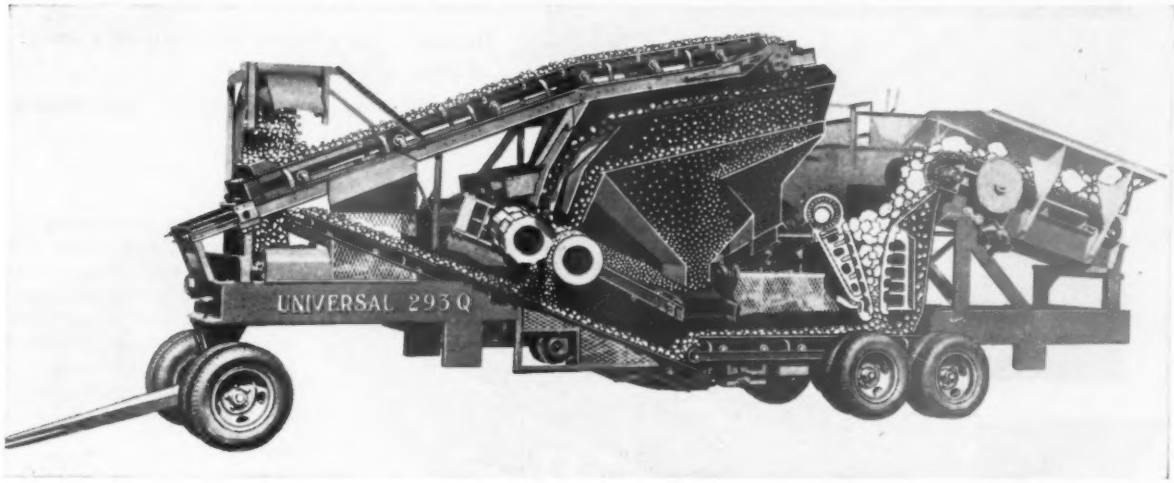
gives you these

EXCLUSIVE

Profit-Making Advantages

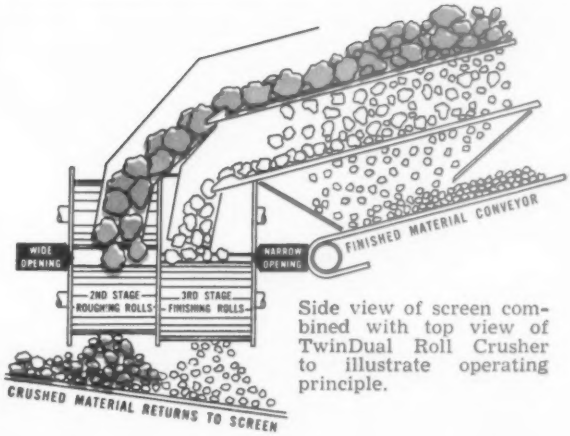
- TwinDual Roll Crusher
- Three separate crushing operations
- Primary and Secondary on single truck
- Only one plant to move instead of two
- Only one power unit to service
- Flexibility for rock or gravel
- 20% greater screening efficiency
- Better quality finished aggregate
- Lower initial cost — lower maintenance cost
- Top production

Jaw crusher and Apron feeder are mounted on separate skid frame to meet highway weight limits.



PIT OR QUARRY — rock or gravel. Name your operation. The TwinDual Pacemaker sets new standards for profitable hour after hour tonnage at low cost per ton. Three crushing operations with Universal's exclusive TwinDual Method provide top capacity, divide the load between three crushing stages. Permit a more favorable ratio of reduction resulting in longer crusher life, less maintenance and better quality finished product.

There is much more to the profitable TwinDual Story. Facts are yours for the asking. Bulletins U520 and U501 will give you detailed information.



Side view of screen combined with top view of TwinDual Roll Crusher to illustrate operating principle.

UNIVERSAL ENGINEERING CORPORATION subsidiary of **PETTIBONE MULLIKEN CORP.**

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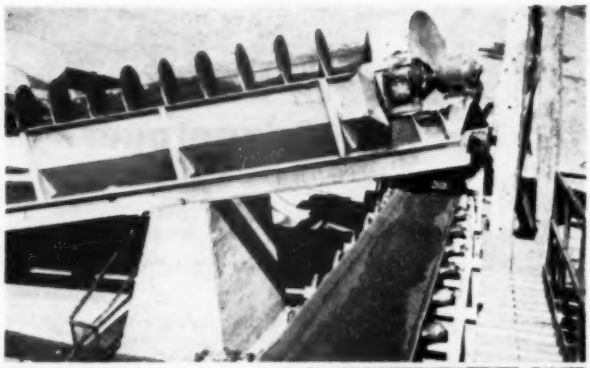
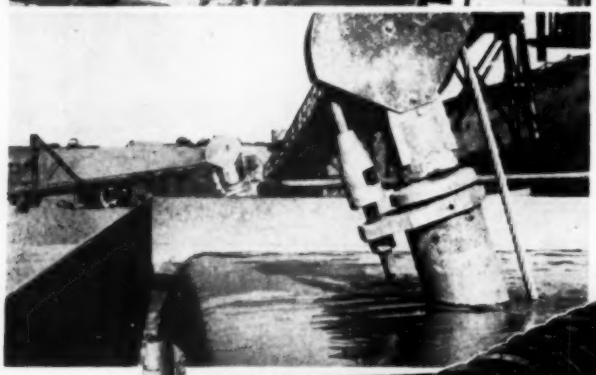
CLEAN SAND and more of it!

WITH WEMCO SAND PREPARATION MACHINES





- A consistently higher production of cleaner sands than is possible by any other method
- flexibility for efficient handling of a variety of jobs
- exceptionally low operating and maintenance costs

These are the outstanding advantages you will obtain with WEMCO Sand Preparation Machines. They provide almost automatic operation for (1) obtaining a sharp sand gradation to meet the toughest specifications, (2) washing, (3) desliming and (4) dewatering.

The exceptionally low operating costs of the WEMCO machine—as low as 4/100's of a cent per ton of washed sand—is the result of design features such as:

FOOLPROOF, ANTI-FRICTION BEARINGS

TOUGH, ABRASION-RESISTANT WEARING SHOES

EFFICIENT, LOW-HORSEPOWER DRIVE

Write today for free catalog and WEMCO's recommendations, given without charge or obligation, for applying these modern machines to your operation.

WEMCO

WESTERN MACHINERY COMPANY

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HMS THICKENERS
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LOOK TO REXWELD HARD SURFACING ROD

IT'S BETTER THESE WAYS:

CUT WELDING TIME

1. Rexweld builds up and holds on an edge better! This means less welding time is required.

INCREASE PRODUCTION

2. Rexweld flows more readily on flat surfaces! In machine gas welding operations valve companies have reported an increase in production per shift using Rexweld.

LESS POROSITY TENDENCY

3. Rexweld has less tendency for porosity because of its smoother flowing and better wetting properties.

BETTER WEARING QUALITY

4. Tests show Rexweld has better wearing qualities.

Hundreds of satisfied users, manufacturing such products as valves, oil pump parts, mixer shafts attest to Rexweld's ability to do a better job . . . at less cost! Rexweld is available in a wide range of grades to meet all requirements. Then too, Rexweld meets Government specifications. If you use hard surfacing rod, be sure you check Rexweld . . . it'll save you time and money.

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54 years of Fine steelmaking

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Check these Profit making Features of the NEW...

DEMPSTER DIGGSTER® GRD-101

✓ **NEEDS NO WHEEL TRACTION**
Loading of the bucket is accomplished by the exclusive Hydraulic Crowd and Hoist power of the Dempster-Diggster.

✓ **MAXIMUM DUMPING HEIGHT**
This is important because the Dempster-Diggster has the digging height capacity to handle jobs oftentimes expected only of power shovels. The dumping height is 9'6" and the digging height is approximately 15 feet. This enables the Dempster-Diggster to work with high dump equipment.

✓ **TORQUE CONVERTER**
Excavating shovels and front end loaders have to take the abuse and punishment of intermittent jolts. The Dempster-Diggster is constructed and built, not only to accept this at its full value, but to smooth out the sudden jerking and jolting by means of a torque converter. The torque converter is a mechanical feature, but its effect on greater efficiency of the machine and lower operating costs is so great it is one of the important reasons why you want a Dempster-Diggster!

✓ **MINIMUM TURNING RADIUS**
The outside turning radius of the Dempster-Diggster is only 18'3".

✓ **ELECTRIC BUCKET TRIP**
You get a machine with an automatic electric bucket trip for dumping drop bottom digging bucket . . . giving you instant dumping and instant closing of bucket.

✓ **TRUCK-SPEED MOBILITY**
Dempster-Diggster moves from job to job without the use of hauling equipment or can be towed behind a dump truck with the use of a tow bar.

✓ **HYDRAULICALLY STEERED**
Your Dempster-Diggster has positive hydraulic steering booster which is operated by separate, individually driven pumps. Your operator stays fresh, will not tire with this finger-tip steering.

Here's a shovel that won't skim the bank or bottom—but gets a full bucket with every stroke. Here's a shovel that gives you the extra speed on the job and to and from jobs that means extra profits to you! Pound for pound, dollar for dollar, the Dempster-Diggster will out-dig and out-load any other available competing machine in tough going! Let us prove that statement! Write for complete information, including Folder No. 3116.

Photo above shows bucket against front of frame in the position which enables Dempster-Diggster to dig 15 inches below grade.

You get a truck payload with a Dempster-Diggster. Note truck is loaded to maximum heaped capacity, yet Dempster-Diggster has ample clearance.

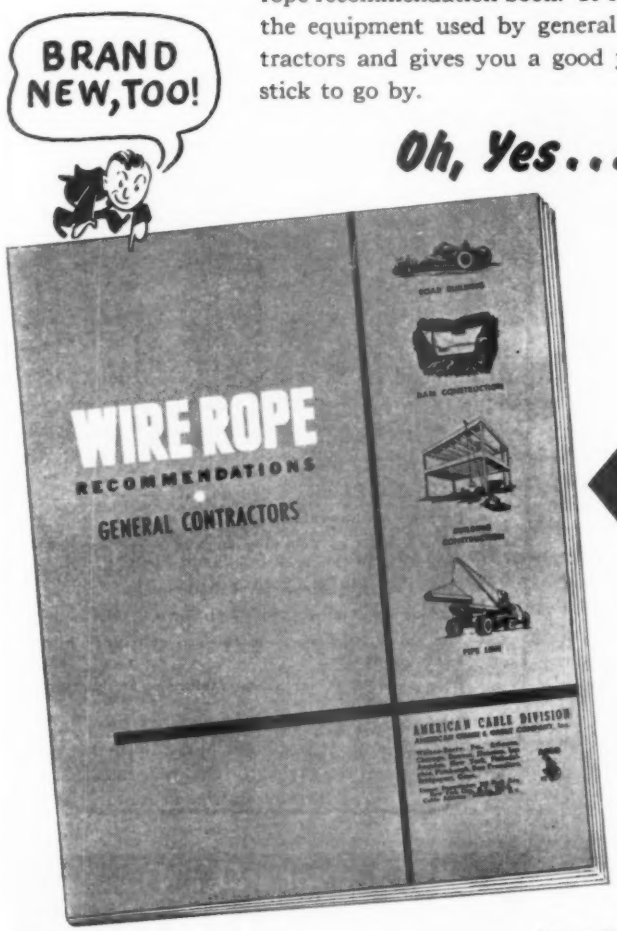
DEMPSTER BROTHERS, 324 N. Knox, Knoxville 17, Tennessee

an ACCO product

Do YOU Want To CUT WIRE ROPE COSTS?

• How long is it since you made a real check of the results you get from the wire rope used on your equipment? If you aren't sure that every rope is giving full value in service life, send for a free copy of this brand new wire rope recommendation book. It covers the equipment used by general contractors and gives you a good yardstick to go by.

This American Cable book is simple to understand, and it's right to the point. It has alphabetical listings by machines and uses. It gives a clear and complete recommendation of the best rope for longest life and lowest cost on each machine or use. It is illustrated with big action pictures of many different machines so you can easily identify most uses.

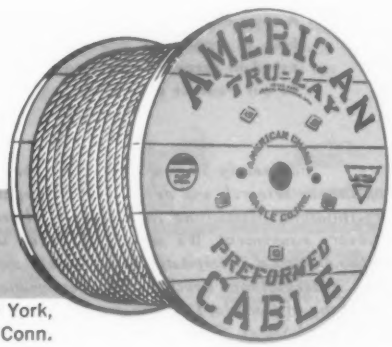


Oh, Yes... DUALOC* Boom Cables

• Here's something very important to all operators of cranes, drag lines, and shovels. This book tells you about the greatest improvement ever made in boom cables—DUALOC. It shows how they work, and *why they last longer.*

You Need This Book

This new "Wire Rope Recommendations for General Contractors" will save you money, and that's sure important in the contracting business today. Write to our Wilkes-Barre, Pa., office for your free copy at once, or pick up one from your nearby AMERICAN CABLE distributor.



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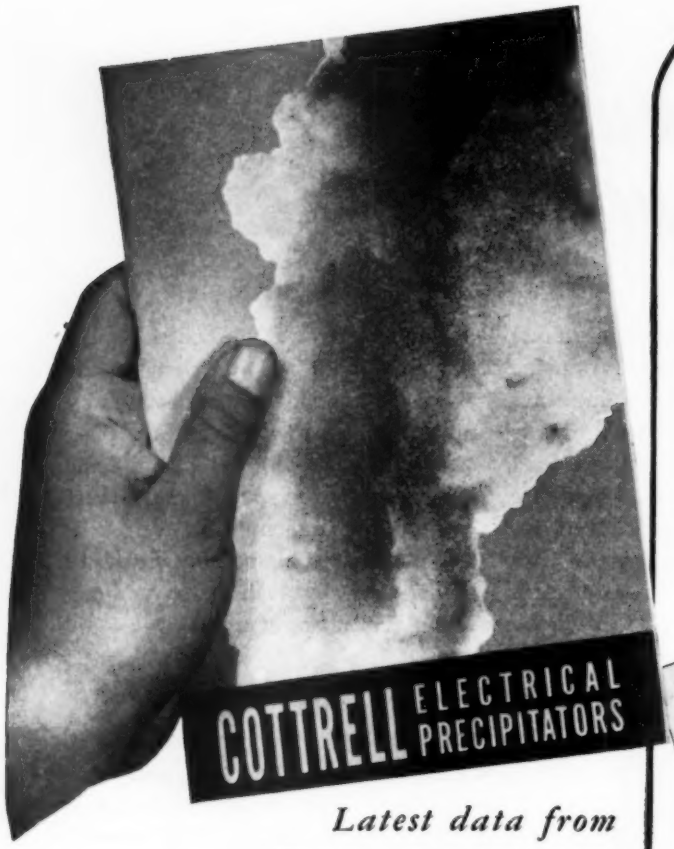

40 PAGES of helpful information

on Recovering Dusts, Fly Ash, Mists, Fumes and other Suspensions from Gases.

This booklet summarizes

the important points design and plant engineers should know about Cottrell Precipitators . . .

- Basic types of Cottrell equipment.
- Principal elements in a Cottrell unit.
- Data on Mechanical and Electronic Rectifiers.
- Various types of Collecting Electrodes (rod curtains, corrugated plates, pocket electrodes, etc.).
- Typical ways of removing collected material.
- Various Shell Constructions (steel, concrete, brick, etc.).
- The effect of various factors on efficiency and performance.
- Data on CMP (Combination Multiclone-Precipitator) Units.

. . . and many other helpful facts on Cottrell design and operation.

Latest data from Western Precipitation on Cottrell Recovery Equipment

Do you have operations in your plant where gas-laden suspensions, wet or dry, are a problem? Such suspensions may be dropping on surrounding property, causing nuisance difficulties. Or perhaps important values are being lost in stack gases that can be profitably recovered. Whatever the nature of your recovery requirements, you will find this 40-page Cottrell booklet of great help. It contains up-to-date data on the latest advancements in the electrical precipitation field – prepared by the organization that pioneered the commercial application of Cottrell Electrical Precipitators almost a half century ago and has consistently led in new Cottrell developments.

A copy of this data-packed booklet will be sent free to engineers and other executives interested in recovery processes. Send your request to our nearest office.

For nearly 50 years Western Precipitation has carried on a continuous research and development program on Cottrell Electrical Precipitators, Multiclone Mechanical Collectors and other types of recovery equipment. We are not affiliated with any other company in the electrical precipitation field except our wholly owned subsidiaries, International Precipitation Corporation and the Precipitation Company of Canada, Ltd. We are equipped to serve you anywhere in the United States, Canada, and throughout the world!

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to every form of manufacture

View shows the MS *"CITY OF QUITO"*, one of the many seagoing vessels dependably powered by NORDBERG DIESEL ENGINES.

ZINC

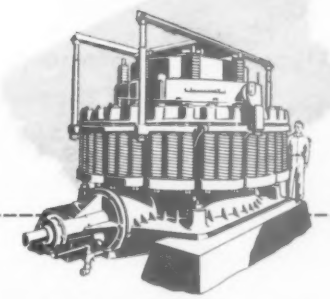
proves its usefulness to man...

Virtually unknown to ancient man, the constantly increasing use of zinc has played an important role in the development of modern civilization . . . on land, from pharmaceuticals to transportation equipment, on through the electrical and telephone industries . . . at sea, from navigational equipment to the many forms of corrosion protection necessary to guard vessels against the elements . . . and in thousands of other applications touching almost every conceivable industry and product, and making our lives better as a result.

In the production of zinc, *as in all of the great ore and industrial mineral operations the world over,* Symons® Cone Crushers have aided in civilization's requirements by making possible increased production to meet growing demands, and by reducing the cost of this production through more efficient crushing operations.

SYMONS . . . A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD

NORDBERG MFG. CO., Milwaukee, Wisconsin



C553

SYMONS Cone Crushers . . . the machines that revolutionized crushing practice . . . are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

SYMONS GYRATORY CRUSHERS

GRINDING MILLS

MINE HOISTS

SYMONS VIBRATING BAR GRIZZLIES and SCREENS

DIESEL ENGINES

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MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

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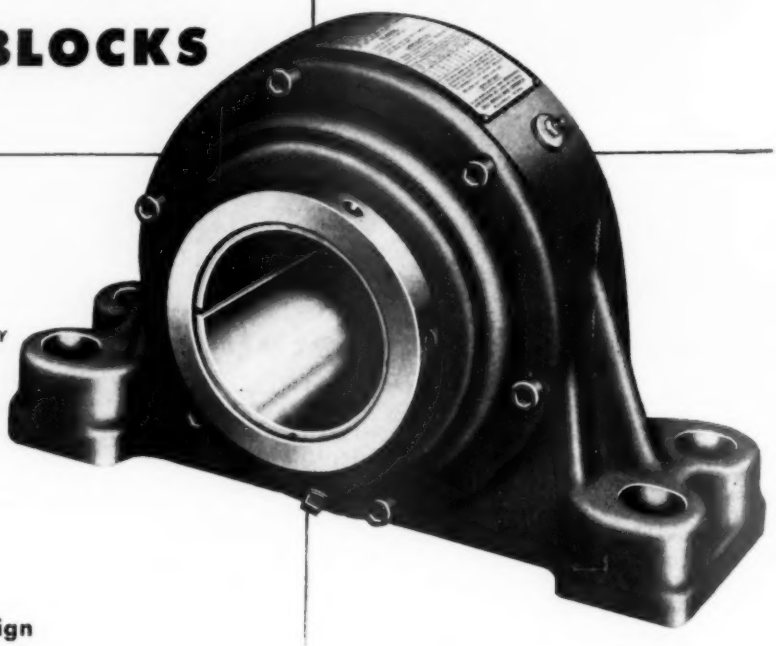
HEAVY DUTY CAPACITY!

LESS SPACE! LESS WEIGHT!



A JOINT ENGINEERING DEVELOPMENT BY DODGE AND THE TIMKEN ROLLER BEARING COMPANY

- All-Steel construction
- A new Timken bearing design
- High radial and thrust capacities
- Compact—minimum dimensions
- Minimum weight with maximum strength
- Fully self-aligning with spherical outer race
- Both expansion and non-expansion types
- Adapter mounting, proven through the years
- Double piston ring seals
- Sealed both on and off the shaft
- Fully assembled, permanently adjusted, lubricated and sealed at the factory

Here are the bearings for industry's toughest jobs. High radial and thrust capacities. Stamina to take heavy shock loads. And all-steel construction packs this load-carrying capacity into less weight and less space. Engineers are already specifying "Dodge-Timken All-Steel" for some of America's largest projects. Write for details and delivery dates, or call your Dodge Distributor.

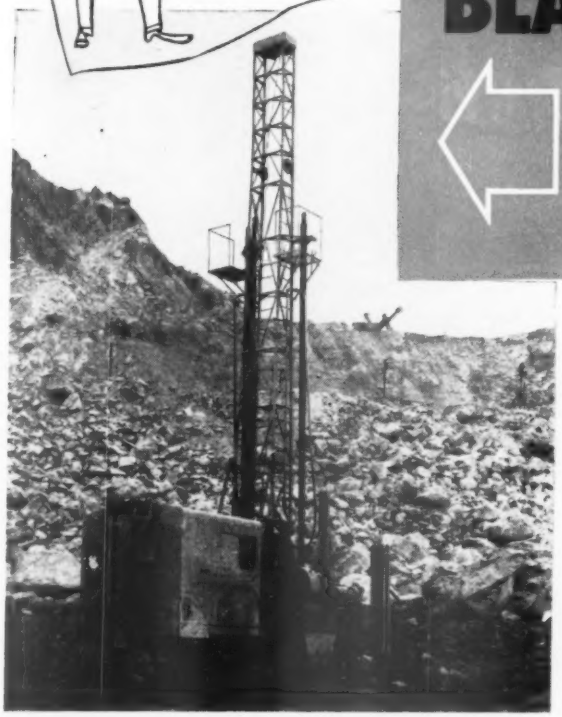
DODGE MANUFACTURING CORPORATION
2600 Union Street, Mishawaka, Indiana

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified phone book.

DODGE
of Mishawaka, Ind.

The JOY CHAMPION BLAST HOLE DRILL

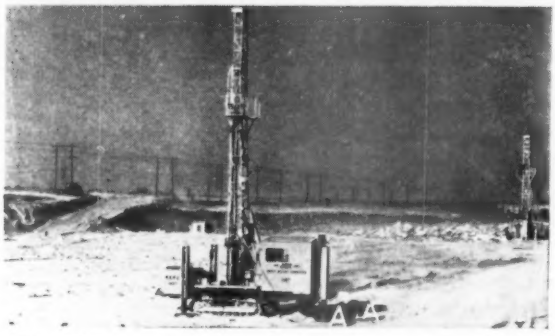
CUTS COSTS TO THE BONE!



. . . at the World's Largest Cement Plant

One Joy Heavyweight Champion Blast Hole Drill replaced three churn drills. Blasting preparation was speeded up, labor costs reduced, and lost holes eliminated. Routine production is now 300 ft. of 7⅞" hole per shift in *dense limestone!*

The ability of the machine to "over-drill" to permit over-shooting has also increased quarry output without increasing manpower. The smooth-walled holes have prompted a change from bag powder to modern cartridge loading, for improved fragmentation.



W&D R4634

. . . on one of the World's Largest Canal Jobs

The Joy Heavyweight Champion is used for speed and economy on this large canal job in the "North" country. During the first two months of operation—while crews were being trained—the average drilling rate, including moving and setup time, exceeded 35 feet per hour, in medium hard limestone. Bit life aveaged 1374.4 feet during this training period. ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Galt, Ontario.*

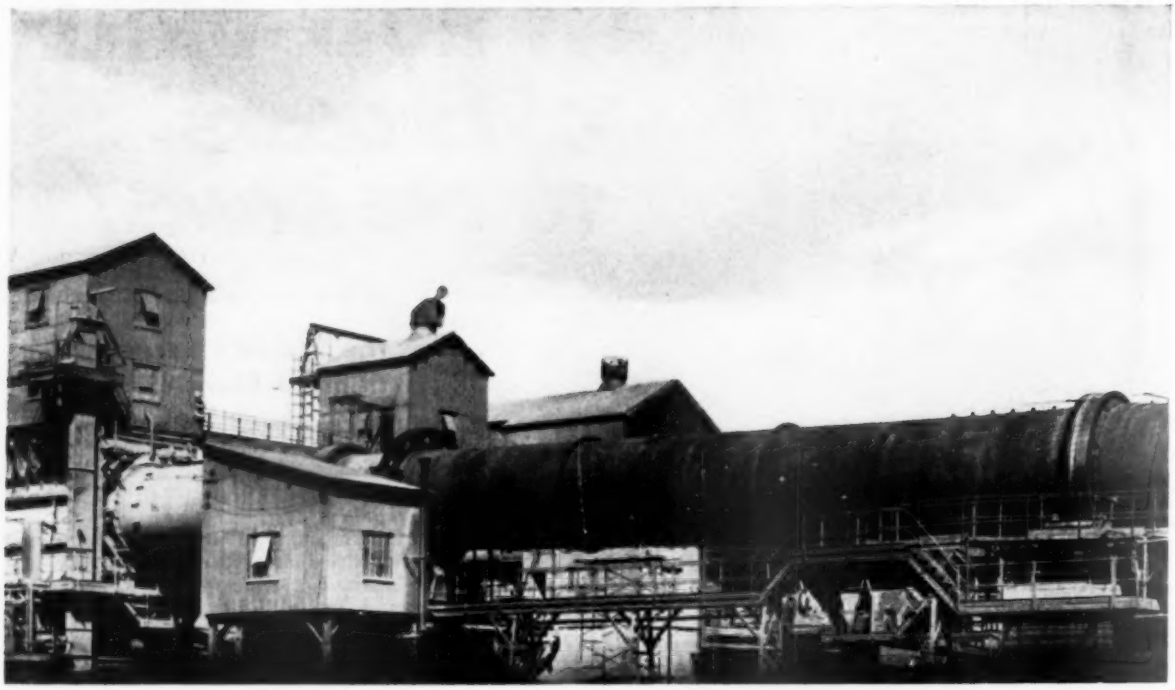
Consult a Joy Engineer

JOY

SINCE 1851—OVER A HUNDRED YEARS OF ENGINEERING LEADERSHIP

SPECIAL KILN...

designed and built by Vulcan for The New Jersey Zinc Co. (of Pa.)



The kiln illustrated above is designed with parts that are exceedingly heavy, because of its type of work. It is 11'3" x 161', used for the WAELZ Process. The supporting bearings, for example, are the largest ever made by Vulcan or any other company. Every other part of this mammoth kiln is correspondingly heavy. The drive is so arranged that the kiln may be driven from either the motor or an auxiliary steam turbine, which is capable of running the kiln at operating speeds.

Because of the product involved, the kiln is tightly sealed against the escaping of interior gases or the admission of outside air.

Any information on items listed below will be sent to you immediately:

- Rotary Kilns, Coolers and Dryers
- Rotary Retorts, Calciners, Etc.
- Improved Vertical Lime Kilns
- Automatic Quick-Lime Hydrators
- Briquetting Equipment
- Open-Hearth Steel Castings
- Heavy Duty Electric Hoists
- Self-Contained Electric Hoists
- Cast-Steel Sheaves and Gears
- Diesel Locomotives
- Electric Locomotives and Larrys
- Steel Plate Fabrications
- Hydraulic Presses

The above installation of a Vulcan Rotary Kiln again shows the result of fine co-operation between the engineering personnel at Vulcan and the engineering personnel and operators at The New Jersey Zinc Company (of Pa.). This great organization, together with many more throughout the United States and the World, have ordered and re-ordered Vulcan of Wilkes-Barre equipment: re-ordered because of its time-tested performance. If any information regarding kilns for any application is needed, the Vulcan Iron Works and its 105 years of experience is ready and able to serve you. Write for detailed Bulletin No. A-442, today.

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50 CHURCH ST., N.Y., N.Y.

WILKES-BARRE, PA., U.S.A.
ESTABLISHED 1849

CABLE ADDRESS
"VULWORKS WILKESBARRE"

2,500,000 TONS Crushed--

"have yet to replace any essential or expensive parts"

SAYS GEN. MGR. OF ROCKYDALE QUARRIES CORP., ROANOKE, VA.

7 sizes; get Bulletin 281

We have a 25x36 Telsmith Jaw Crusher which we installed in 1945. From that time to this we have put through that crusher almost two and a half million tons of dolomitic limestone and have yet to replace any essential or expensive parts. The cost has been an extreme minimum and..we are happy to recommend this crusher to anyone with similar problems.

ROCKYDALE QUARRIES CORPORATION

Gordon C. Willis

Gordon C. Willis, General Manager

C-9

TELSMITH Jaw Crushers

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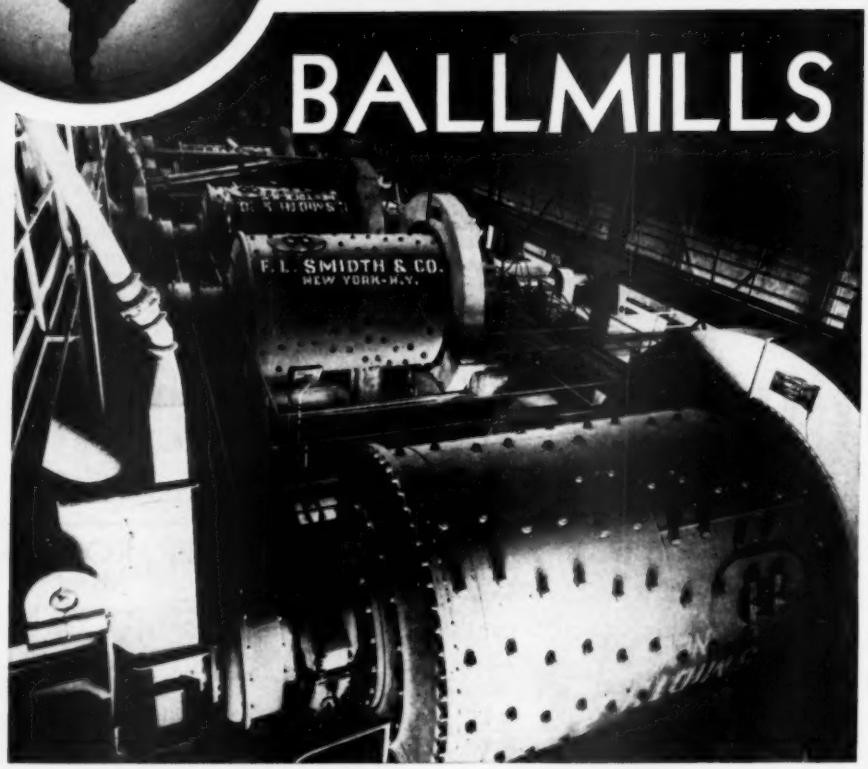
SMIDTH

BALLMILLS



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"WE HEAR..."

February, 1954

Heavy construction awards, nationally, totaled $15,171 million for 1953, the second highest year in dollar volume on record, or 5 percent below the record high of $15,700 million set in 1952, as reported by Engineering News-Record. State and municipal public works pushed the 1953 total to a new all-time high of $5,088 million, or 22 percent above the 1952 total. Private construction also set a new record in 1953 with total awards amounting to $8,665 million, or 20 percent above the 1952 awards. Federal construction awards of $1,417.6 million were, however, 69 percent under the 1952 total and the smallest year for federal construction since 1949.

* * * * * * * * * *

Since lime is an important chemical used in the purification of water supplies, lime producers may find of interest an item recently reported in Chemical and Engineering News, which stated that about 70,000,000 people in this country use drinking water from sources also used as sewage disposal systems, thus making a great need for projects to abate pollution and conserve water. According to the report, contracts for 204 such projects were awarded by municipalities in the second quarter of 1953, representing $64,600,000, or a 55 percent increase over the amount reported for the same quarter of 1952.

* * * * * * * * * *

Wanton destruction of plant equipment by juveniles seems to be on the increase, as evidenced by a number of such reports recently received by the editors. One of the most damaging occurrences reported involved the plant of Nevada Rock and Sand Co., Las Vegas, Nev., which has reported thousands of dollars worth of damage since last June. The latest foray occurred on a holiday when the plant was shut down. Before the juveniles were detected, they had shot two tires off a jeep; tried to shoot the padlock off a storage building; stole a number of items; disabled a 10-wheel truck by driving it into a pile of rock; and turned over a skip loader by driving it on a pile of sand. Earlier raids on the plant involved the theft of a considerable amount of gasoline and oil and about $700 worth of tools; the wrecking of a jeep by driving it off a bank; and the wrecking of a skip-loading machine by driving it into a water-filled settling basin. A company official stated that he was either going to have to hire guards 24 hrs. a day, or shut down the plant.

* * * * * * * * * *

In the eight years since the end of World War II, American railroads reportedly have spent over $9 billion on capital improvements, while their net income has totaled only about $5 billion. For the year 1953, considered one of the best years from an earnings standpoint, the railroads reportedly earned a return of only about 4¼ percent on net investment in their transportation properties.

* * * * * * * * * *

Construction costs, after remaining almost stationary in the four months September through December, moved slightly upward in January, as reported by Engineering News-Record. The Construction Cost Index for January was listed at 614.04 (based on 1913=100), or 0.4 percent above the December value and a new all-time high. Material prices and labor rates paid by contractors averaged 4.4 percent higher than in January, 1953. The Building Cost Index for January, 1954, was 436.88 (also a 1913 base), or 0.2 percent higher than December, but still slightly below the all-time high of 436.98 set last August, and 2.8 percent above the January, 1953, figure.

* * * * * * * * * *

As recently reported by Missouri Pacific Lines, railroads spent over $1,200,000,000 in 1953 for improvements to plant and equipment, making the sixth consecutive year of annual railroad capital expenditures above the billion-dollar mark.

WE HEAR

New equipment for analyzing elements present in a given material has been developed by North American Philips Co., Mount Vernon, N.Y. The new development consists of an attachment for the X-ray spectograph unit, which uses helium instead of air in the path of its X-ray beam thus making it possible for the spectograph to work with elements it otherwise couldn't analyze. According to the company, consistently good results previously were possible in the spectogram range only from calcium, which has an atomic number of 20, up to uranium with an atomic number of 92. The use of helium is claimed to extend the work down to sulphur, which has an atomic number of 16. Biggest users of the new attachment are expected to be in the mineralogical, metallurgical and oil industries.

* * * * * * * * * *

A temporary injunction restraining further excavating operations has been issued against a western sand and gravel company, following a complaint filed in Superior Court by the local city ordinance. The suit charges that the gravel firm entered lands belonging to the municipal sewer farm and diverted the natural flow of a river crossing the lands. The city is seeking $25,000 in alleged damages, removal of the dam across the river bed, prevention of further excavation on the property in question, and refilling of the excavations already made. Both the gravel company and the city claim title to the land in question.

* * * * * * * * * *

Using stone quarry equipment for rifle-target practice seems to be an increasing pastime for teen-age vandals. The latest such vandalism reported was at the Concrete Materials quarry at Cedar Rapids, Iowa, where rifle slugs had been fired into two large power shovels, a drilling machine and a crusher. Tires, radiators, cab windows and controls were punctured. The company also lost an estimated 1400 tons of production while the equipment was being repaired. Total damage and loss was estimated at $1500.

* * * * * * * * * *

The Ontario Highways Department reportedly is testing the possibility of rubber highways for the future. The experiment is being carried out on a 10-mile section of highway just north of Toronto. The middle section of the test road, a 2-mile strip, was built with a natural rubber additive in the asphalt mix. The remainder four miles at each end of this rubber section, which are the control sections, were constructed of conventional materials, for comparison. Engineers selected this section of highway three years ago, as the traffic conditions there are said to approximate the conditions under which future Ontario highways must be built.

* * * * * * * * * *

The theft of 15 sticks of dynamite and a box of percussion caps from a Kansas City, Kan., stone quarry was recently solved when two teen-age youths confessed to the robbery after being apprehended when attempting to set off the charges at an old quarry site. The number of such thefts continually being reported further emphasizes the need for more caution in the safe storage of dynamite.

* * * * * * * * * *

Steel production reached new highs during the year ended August 31, 1953, as recently reported in Steel Facts. Over 114.6 million tons of steel were produced during the 12-month period. The previous record was 107 million tons in the 12 months starting April 1, 1951. Other records were also set by the industry. Its estimated total employment, excluding non-steelmaking operations, was higher than ever before, at 696,000 persons. Its shipments of finished steel products in the first half of 1953 were 28 percent higher than in the first half of the previous year. Shipments of sheet and strip steel, tin plate and allied products reached a record-high total of approximately 16.8 million tons. Plant capacity was also at an all-time high.

* * * * * * * * * *

The State of Kentucky was recently granted permission from the state's Court of Appeals to start construction of the first section of the state's portion of the planned Chicago-Florida limited access expressway. Preliminary surveys already have been made for the 40-mile stretch from Louisville to Elizabethtown. Cost of this 40-mile section is estimated at $30,000,000. It is planned to finance this through the issuance of 20-year revenue bonds, to be paid off through the tolls collected. Participating in the Chicago-Florida expressway project, besides Kentucky, are Indiana, Tennessee, Georgia and Florida.

THE EDITORS

You get more—much more—than a machine when you buy a MARION. Some of the other important benefits for you:

A GOOD NAME—Since 1884, MARION has been a trusted name in excavating machinery.

GOOD MACHINES — MARION has consistently pioneered the major refinements and developments in power shovel design and developments. These machines are built to the world's highest standards of quality.

GOOD SERVICE — World-wide availability of parts and service is a big plus, for international travel for excavating machinery is commonplace today.

THE MOST COMPLETE LINE—No other manufacturer offers the variety of types and sizes of machines available from MARION. It is easy to get the right machine for your particular requirements.

Before you make the sizable investment required to purchase any excavating machine, be sure to learn what these and other MARION benefits can mean to you.

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from ¾ cu. yd. to 45 cu. yds.

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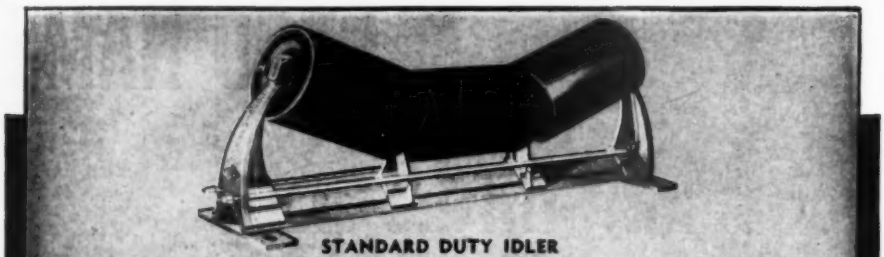

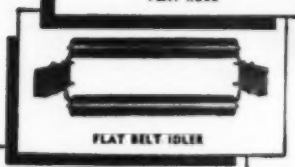

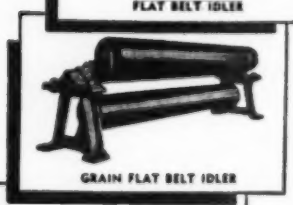

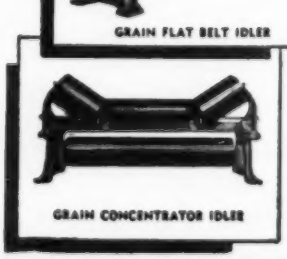

Belt conveyors are used for handling many types of material. For this reason, Continental manufactures a variety of Idlers each designed to best take care of a particular application.

When ordering your next Belt Conveyor specify Continental Idlers and take advantage of our complete line.

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Smooth-flowing VICTORTUBE goes on faster, cuts parts rebuilding time, thus gets your equipment back to work quicker.

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where severe abrasion is encountered, parts rebuilt with VICTORTUBE outwear the original three to five times — *your equipment stays on the job longer* . . . and you reduce parts inventory.

Owner Ed Blood rebuilding teeth on 28" bucket auger with VICTORTUBE "Special" at Berkeley Bit Service, Berkeley, California. VICTORALLOY used on bucket wear pads (left).

Prolong Parts Life NOW with These VICTOR Hard-facing Alloys

THIS HARDFACING ROD	FOR THESE CONDITIONS	FOR SUCH EQUIPMENT
VICTORALLOY	Abrasion and severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers
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Dig, haul and load to crusher . . . average two tons a minute in a nine-hour day

The 72-hp. HD-9G has ample power to dig into tough rock piles and come out with a big payload every time. Wide bucket permits quick loading and safe handling of large rock. These dependable tractors are on the job nine hours a day, six days a week.

Production costs are being cut in a large rock quarry in Iowa, by two Allis-Chalmers HD-9G Tractor Shovels, and their use is bringing additional efficiency to the entire operation.

These two tractors, equipped with standard two-yard buckets, load rock directly from quarry face to rock crusher, eliminating the need of continually moving crusher. What's more, the speed of these two units enables the crusher to load out 135 eight-ton trucks a day.

The excellent performance of the two Allis-Chalmers Tractor Shovels has attracted the attention of local contractors and county officials. Many have stopped by especially to see these two machines at work.

Let your Allis-Chalmers dealer show *you* the HD-9G at work. See how it can bring new efficiency to your operation.

With the Tractor Shovel method, rock is handled only once from quarry to crusher. Crusher is able to load out 135 eight-ton trucks a day when fed by these fast-working Allis-Chalmers tractors.

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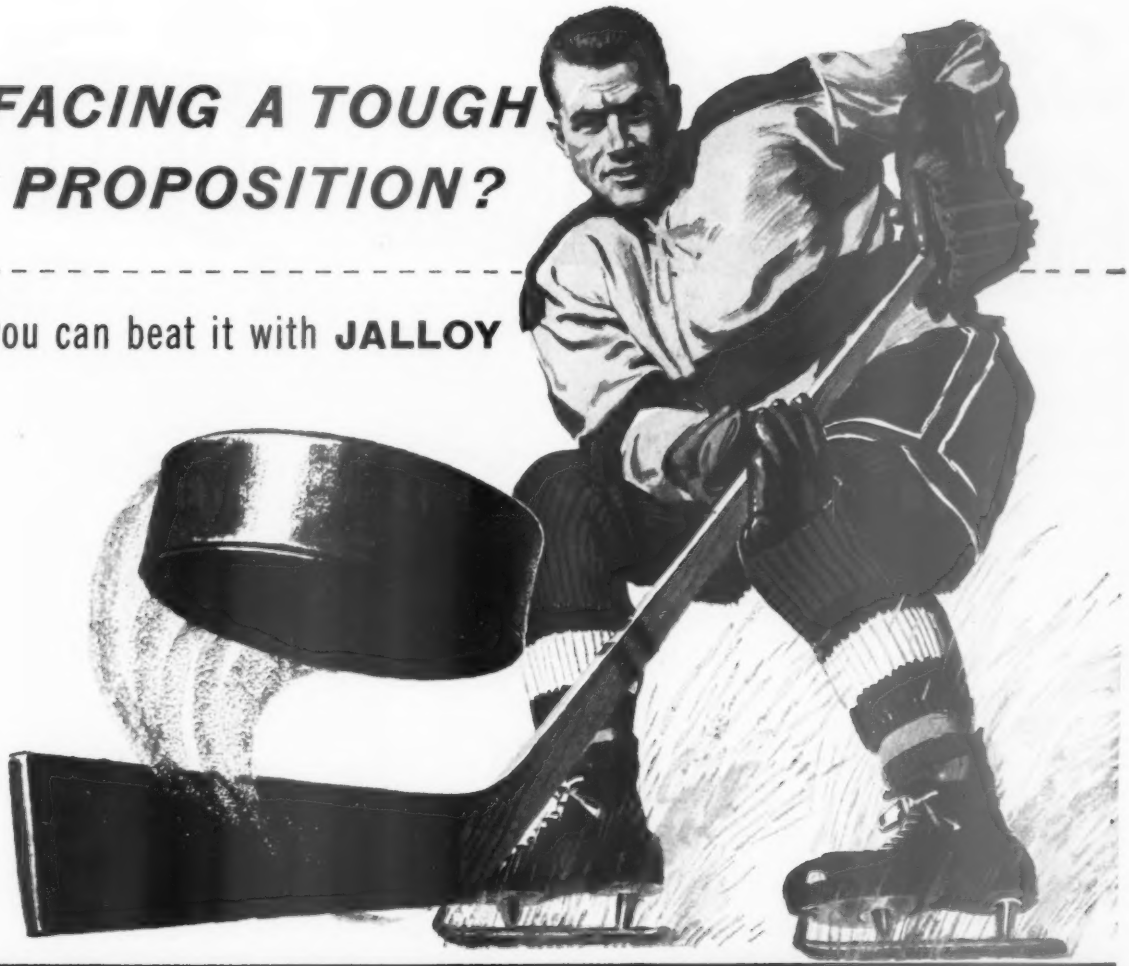
you can beat it with **JALLOY**



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J&L Jalloy Heat-Treated Plate is the general purpose steel that is heat treated to provide longer wear on applications where impact and abrasive conditions are severe.

In comparison with other abrasion-resistant steels as well as mild steels, it gives optimum results when heat treated to a Brinell hardness of 340 and up. Jalloy permits savings in steel costs, maintenance, and repair. Furthermore, it is easily welded.

Jalloy is available in three grades to meet various service requirements.

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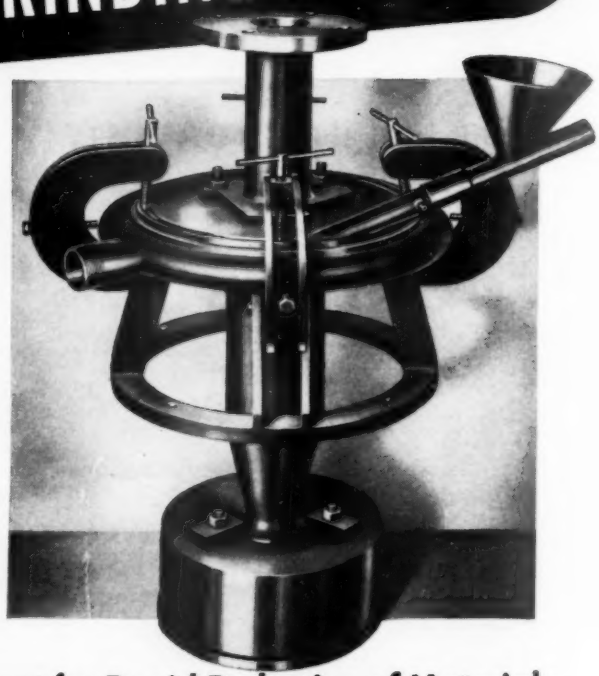


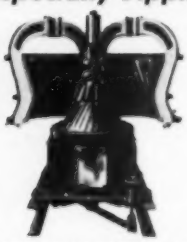
Reduces Solids to Micron Sizes

The new Sturtevant *Micronizer* grinding machine is a fluid jet grinder especially designed to reduce solid materials to particle sizes in the micron ranges.

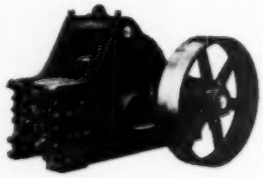
Sturtevant *Micronizers* are used for simultaneous dry grinding and classification of solids. The variety of materials that can be processed is large and includes both metallic and non-metallic minerals and ores, metals, pigments, insecticides, fungicides, pharmaceuticals, plastics, dyes and numerous other organic and inorganic products. Available in capacities from ½ to 3000 pounds per hour.

Other Sturtevant Pulverizing Equipment for Rapid Reduction of Materials...

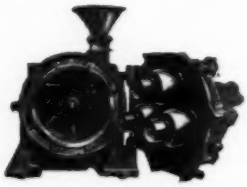
Especially Applicable for Initial Grinding of Products for the Micronizer Mill



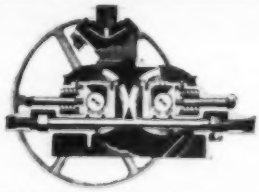
ROTARY FINE CRUSHERS for intermediate and fine reduction (down to ⅛"). Open door accessibility. Soft or moderately hard materials. Efficient granulators. Excellent preliminary Crushers preceding Pulverizers.



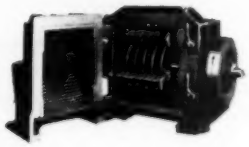
JAW CRUSHERS for coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.



RING-ROLL MILLS for medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operated in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.



CRUSHING ROLLS for granulation, coarse or fine, hard or soft materials. Automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8 x 5 to 38 x 20. The standard for abrasives.



SWING-SLEDGE MILLS for coarse and medium reduction (down to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

AIR SEPARATOR for separation of fines to 325 mesh and finer. Increases output from 25% to 300%... lowers power costs by 50%. Capacities ¼ to 50 tons per hour output.

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Le Roi *TRACTAIR* with Mobildrill!

TALK about flexibility — you really get it from Le Roi Tractair with Mobildrill.

Mobildrill is a lightweight Le Roi-CLEVELAND wagon-drill attachment mounted on Tractair, a combination 35-hp tractor and 105-cfm compressor. With it, you enjoy unusual mobility. One man can drill holes at any angle and any elevation up to 12 feet. Swinging boom permits drilling 4-6 holes of a pattern from one spot.

Tractair is really a handy man around a quarry. Its mobility makes it ideal for secondary drilling and drilling toe, as well as for production drilling. You can use it to run hand-held drills and plug drills. And you can use it to run an air-operated sump pump for de-watering.

Have your Le Roi distributor show you Tractair at work, so you can get a first-hand picture of its money-saving versatility. See him soon. Write for job-data sheets and Le Roi Tractair bulletins.

LE ROI COMPANY

A Subsidiary of Westinghouse Air Brake Co.
MILWAUKEE 14, WISCONSIN

Plants: Milwaukee • Cleveland — Greenwich — Dunkirk, Ohio • Coldwater, Mich.

T-33

QUARRY OWNER HITS 1,273 TONS DAILY OUTPUT WITH HIGH-SPEED SCHIELD Bantam® METHOD

W. B. Mount, Maymead Lime Co., Shouns, Tenn., AVERAGED 127 CU. YDS. HOURLY in one 9 hour day . . . AVERAGED 1,273.04 TONS daily in a 9-day operation, loading out stockpiled crusher run stone! According to Mount, this remarkable production record was achieved the FIRST time they had enough trucks to keep up with the BANTAM! Here is the daily record:

1st Day	— 1146.27	Tons
2nd "	— 1142.00	"
3rd "	— 1186.11	"
4th "	— 1234.00	"
5th "	— 1392.00	"
6th "	— 1467.00	"
7th "	— 1436.00	"
8th "	— 1346.00	"
9th "	— 1108.00	"
TOTAL	11,457.38!	

OWNER PLEASED WITH PERFORMANCE

"Needless to say," commented owner Mount, "we are very much pleased with this piece of equipment in handling our agricultural lime and construction stones!"

You, too, can realize tremendous production boosts and savings in equipment and manpower costs with the low cost BANTAM method! BANTAMS cost you less to buy . . . less to own and operate, and get the tough jobs done faster!

NOW is the time to see a BANTAM in action ON YOUR JOB! A free demonstration can easily be arranged WITHOUT OBLIGATION! See for yourself how the BANTAM feeds crushers and ready-mix batching plants . . . how the BANTAM Truck-Crane with its big 12,000 lb. lifts can replace your older gin-pole methods for faster handling of cut stone . . . how the BANTAM keeps up with a constant stream of trucks in your pit!

BANTAM'S NEW CRAWLER . . . with low ground bearing pressure, brings added efficiency to the sand and gravel pit. Full Circle swing makes it easy to load out of tight spots or to trucks on either side of rig! Independent, 2-speed travel makes easy work of side-bank digging . . . Automatic dipper trip (optional) cuts time between bites to a minimum!

YOU CAN'T AFFORD NOT TO OWN A BANTAM

It makes good dollar sense! Low initial cost . . . low operating cost . . . low upkeep and repair . . . that's the economy of owning a BANTAM! All this PLUS high production and many time and labor saving features normally found only on larger, more expensive rigs, adds up to profitable operation in any man's language. There's a BANTAM mounting, too, that will fit your needs EXACTLY! BANTAMS mount on Crawlers . . . Crane Carriers . . . Remanufactured trucks or on your own truck! See for yourself! Ask for a free demonstration on your job . . . ask for free literature on the BANTAM Shovel-Crane Line . . . DO IT TODAY!

SB — TMSH — 1

SCHIELD Bantam

COMPANY • 216 PARK ST., WAVERLY, IOWA, U.S.A.

WORLD'S LARGEST PRODUCERS OF TRUCK-CRANES AND EXCAVATORS

highway builders

...ROGERS CONSTRUCTION CO.

use TELSMITH plants

Mr. Charles McInroe of Rogers Construction Co., Portland, Oregon who produced the aggregate for this section of the Columbia River Highway, says: "We have used your equipment almost exclusively—your 48-S Gyrasphere does the work of two crushers—we have several of your 24 x 36 Jaw Crushers — one since 1942 — our superintendents do not want any other type—your feeder has out worn three other types—with your Super-Scrubber we got one of the cleanest materials we have produced in a long time—this equipment has made it possible for us to make a success of our business."

Send for Bulletin 266.

Troutdale-Dodson Section
Columbia River Highway

A Rogers Construction Co. Telsmith Plant

SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

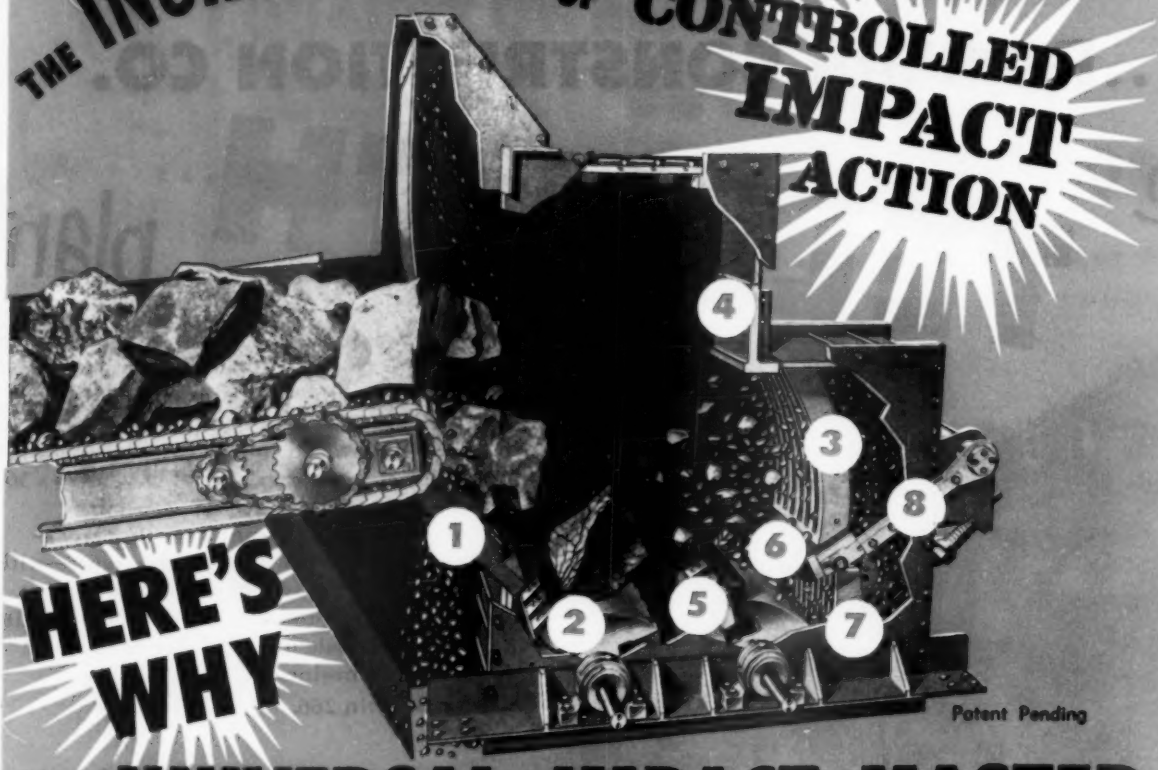
Cable Address: Smigworks, Milwaukee

51 East 42nd St., New York 17, N. Y. — 211 W. Wacker Drive, Chicago 6, Ill. — 713 Commercial Trust Bldg., Philadelphia 3, Pa. — 324 Main Street, Cambridge 42, Mass. — Stedtfeld Eqpt. Co., Milwaukee 3, Wis. — The Holmes Co., 1125 Lakeside Ave., Cleveland 14, Ohio

Marrow Eqpt. Co., Rochester, Mich. • Rish Eqpt. Co., Charleston 14, & Portsmouth, Ohio—Charleston 23, & Clarksburg, W. Va.—Roanoke 7, & Richmond 19, Va.

Robert S. Briley, 610 W. 5th St., Los Angeles 17, Calif. • Hilmer Eqpt. & Eqpt. Co., San Francisco 4, Calif. • Clyde Eqpt. Co., Portland 8, Ore., & Seattle 4, Wash.

THE INSIDE STORY OF CONTROLLED IMPACT ACTION



THE UNIVERSAL IMPACT MASTER

gives you top capacity . . . lower costs . . . greater control of finished product size

Adjustable feed plate (1) guides in-coming rock at proper angle into first rotor hammer circle (2). Infed rock is intercepted in motion, exploded instantly by the terrific impact of the rotor hammers and simultaneously projected toward deflector screen grate (3) where finished sizes are immediately discharged.

Oversize particles are deflected upwards, intercepted by feed chute back plate (4) and guided downward into the path of the second rotor hammer circle (5) where they are exploded and projected toward the bottom half of the deflector screen grate and the lower screen grate (7) for immediate discharge.

Both rotor hammers rotate in the same direction toward the rear, promoting fast feeding and keeping all material flowing toward the discharge for top capacity.

Finished product sizes are controlled by the speed of the rotor hammers, and by simple adjustments (8) of stripper bar (6) and lower screen grate.

By controlling the infed rock and directing its flow, the breaking is accomplished by the impact of rotor hammers upon the rock. This reduces wear and makes possible the more uniform gradation cubical aggregate.

GET THE FULL PROFIT-MAKING STORY

Write for literature. Get complete details on the Universal Impact Master. Learn all about its high ratio of reduction which eliminates secondary crushers and auxiliary equipment. Get top quality uniform gradation cubical aggregate and greater production of saleable finished sizes. Impact Masters are used in open and closed circuits for producing road-building and concrete aggregates, and can be adjusted for the simultaneous production of aglime when desired. They are available with capacities to 750 tons per hour. Write today.

UNIVERSAL ENGINEERING CORPORATION *Subsidiary of* **PETTIBONE MULLIKEN CORPORATION**

617 C Avenue N.W., Cedar Rapids, Iowa
Phone 7105

4700 West Division St., Chicago 51, Illinois
Phone Spaulding 2-9300

Reo for LP-Gas, with base, skid ends, tow bar, direct-drive power takeoff, heavy-duty air cleaner, and complete instrumentation including a visual alarm system and automatic shutdown.

NOW REO RELIABILITY in packaged power

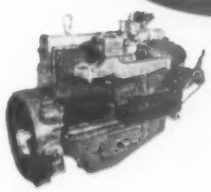
More Heavy-Duty Features . . . Lower Operating Costs

Dependability! Economy! These two "musts" now can be *yours* in Reo Industrial Power Units.

You get world-famous Reo spark-ignition engine design—already used on well over 100,000 military and commercial vehicles—skillfully adapted to industrial needs. A wide choice of supplementary equipment for special applications is available.

Replaceable wet cylinder sleeves eliminate *costly* reboring. Reo overhead valve design provides more efficient combustion. Seven main bearings with interchangeable inserts assure long-lasting smooth operation. You get an integral oil cooler, a full-flow oil filter, a large-capacity oil pump, and a fully controlled bypass cooling system, plus all of the heavy-duty Reo features military and civilian operators appreciate.

Reo Industrial Power Units are *factory-built* to operate on gasoline, natural gas, liquefied petroleum gas, or in dual-fuel combinations. For every service or service requirement from 50 to 180 continuous horsepower, you can look to Reo for the experience and quality that mean *outstanding* engine performance. Parts and service coast-to-coast. Write for specifications and the name of nearest dealer.



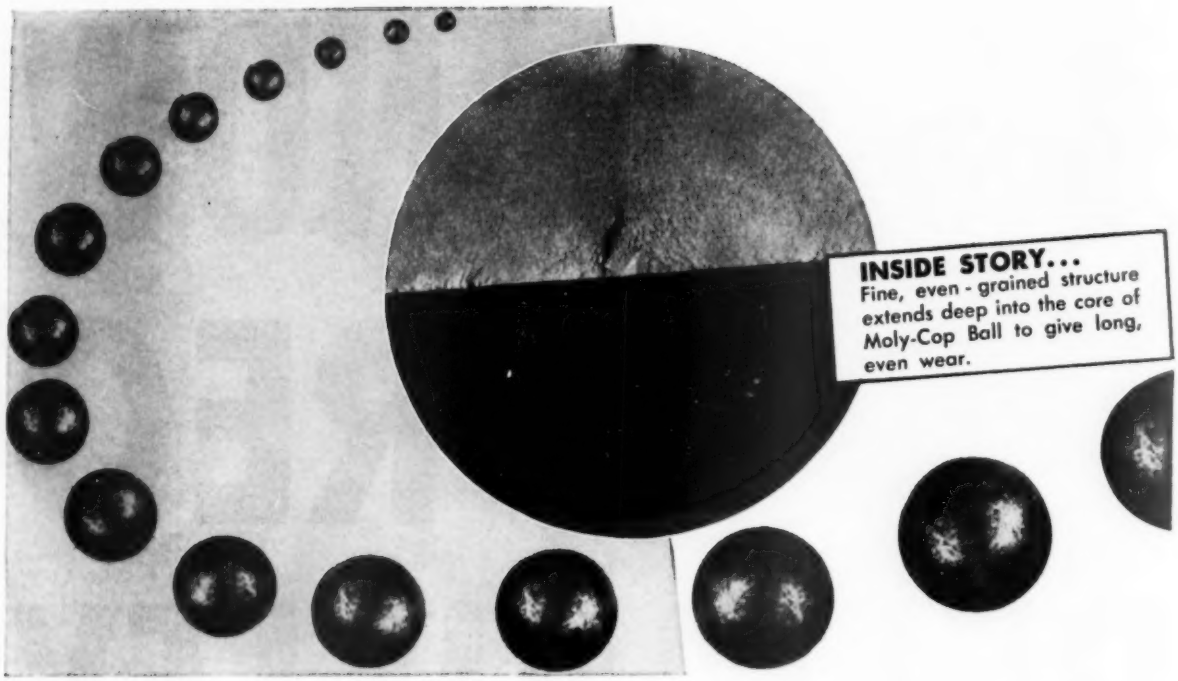
Basic Reo Gasoline Industrial Engine. Designed for continuous operation even when tilted 15°.

Reo with base, full hood, and side panels. Either right-hand or left-hand rotation is available.

EXCELLENT FOR . . . stationary, portable, or mobile power in the pit, at the plant, on the job. Engine is available with variable-speed governor; normal-duty air cleaner, or heavy-duty with precleaner; 6 or 12-volt ignition and starting; direct-drive PTO, reduction-gear-drive PTO, fluid coupling, or spring-loaded clutch; 3½", 4", 6", or 7" channel base; radiator, or expansion tank for use with remote cooling coils; blower or suction cooling fan; exhaust pipe with heat shield and rain cap; partial or full hood; instruments. We'll be glad to recommend the right complete engine for your specific needs.

INDUSTRIAL & MARINE ENGINE DIVISION

REO MOTORS, INC., Lansing 20, Michigan



If you want a finer grind . . . use a finer ball!

SHEFFIELD MOLY-COP

TRADEMARK REG.

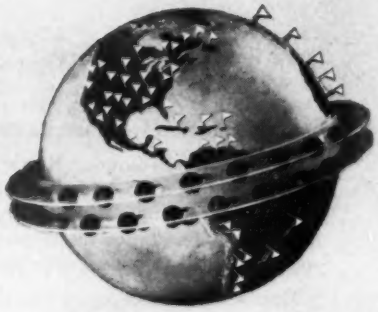
COPPER-MOLYBDENUM-ALLOY

Grinding Balls

For fine grinding you want a ball that will give you the highest possible production rate with the lowest cost per ton of material ground . . . fewer chargings, less "down time."

Sheffield Moly-Cop Balls meet that requirement — because Sheffield's exclusive alloy and automatically controlled manufacturing methods produce a ball of finer, denser, more uniform structure. You get toughness and greatest resistance to abrasion. Moly-Cop Balls wear evenly, retain their spherical shape longer.

Tests have proved that Moly-Cop Balls wear up to 35% longer than alloy cast steel balls; up to 50% longer than best quality unalloyed carbon forged steel; and up to 120% longer than cast white iron balls. Considering initial costs and length of service, the net savings that result from the use of Moly-Cop Balls are substantial.



Used and proved around the world—*Sheffield engineers* are ready to prove the money-saving advantages of Moly-Cop Grinding Balls in your operation. Get in touch with us now.

Export Representatives: ARMCO INTERNATIONAL CORPORATION, MIDDLETOWN, OHIO

SHEFFIELD
STEEL
CORPORATION
HOUSTON KANSAS CITY
TULSA
SUBSIDIARY OF ARMCO STEEL CORPORATION

"Eucs" SURE DO THE JOB!

Euclid Scrapers—12, 15.5 and 18 cu. yds. struck...190 to 400 h.p. engines... top speeds, loaded to 30 m.p.h.

Bottom-Dump Euclids—13, 17 and 25 cu. yds.... 190 to 300 h.p...top speeds loaded to 35 m.p.h.

Rear-Dump "Eucs"—10, 15, 22, 34 and 50 tons ...125 to 600 h.p...spring mounted or semi-rigid drive axles...top speeds loaded to 36 m.p.h.

On construction and mining jobs the world over you'll hear owners say, "those 'Eucs' make more money for us and do more work than any equipment we've ever used." Operators, too, like "Eucs" because they're easy to handle and have plenty of what it takes to haul and dump big loads in tough going.

There are lots of reasons why men who know earth moving equipment specify Euclids, but they all add up to one simple fact . . . "Eucs" move more loads per hour at the lowest cost per ton or yard of material moved. Profitable performance on all types of work is proved by the fact that over 60% of all Euclid equipment sold is repeat business from satisfied users.

When competitors are using "Eucs" to move dirt or rock faster and cheaper than you are, you can't afford to pass up the cost cutting advantages you get in Euclid equipment. For the recommendations of a hauling equipment specialist and a production and cost estimate on your job, get in touch with your Euclid distributor . . . there's no cost or the slightest obligation.

EUCLID DIVISION GENERAL MOTORS CORPORATION Cleveland 17, Ohio

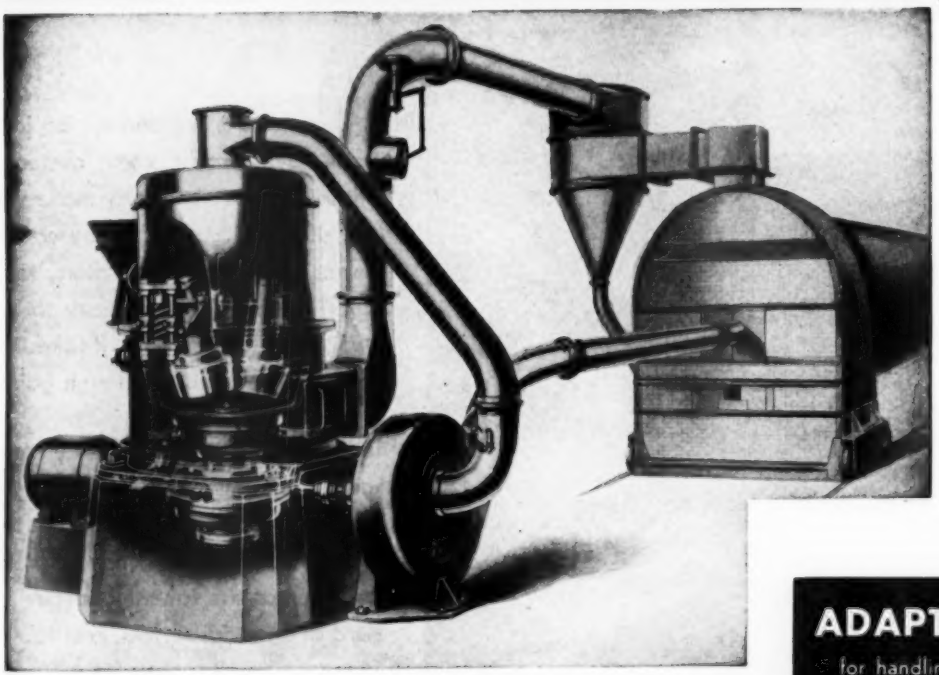
EUCLID THE PIONEER

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

How Raymond BOWL MILL FIRING



THE Raymond Bowl Mill is entering its 20th year of service to the non-metallics industry for direct firing rotary kilns.

Today, more than 12 million tons annually (rated capacity) of coal are pulverized on Bowl Mills in the lime, cement and dolomite fields alone.

Raymond "Bowl Mill Firing" can become an important factor in your "planned economy" for the critical year ahead by reducing your kiln operating costs and improving production quality.

Its ready response to load changes, ease of control, over-all efficiency and high availability, are advantages that will pay off in extra savings and larger plant output.

Write us for further details of this fully coordinated, automatically controlled direct-firing system.

ADAPTABLE

for handling coal of any grade, grindability or moisture content.

DEPENDABLE

for continuous non-stop operations for months at a time without shutdowns.

ECONOMICAL

Low power consumption per ton of coal pulverized and low operating costs in production of cement or lime.

Bulletins ON REQUEST

COMBUSTION

RAYMOND DIVISION

Gives **BETTER OPERATING CONTROL AND GREATER KILN ECONOMY**

CATALOG No. 62

Ask for your copy of the Bowl Mill Catalog No. 62

BOWL MILL VISUAL CONTROL PANEL

This Raymond control system enables the operator to supervise several Bowl Mills with a minimum of effort.

The panel board gives a complete operating picture of the mill at all times. Close regulation of the mill, and its instant response to any changes, insure uniformity in grinding and firing . . . the key to economy in kiln operation.

ENGINEERING, Inc.

1307 NORTH BRANCH STREET • CHICAGO 22, ILLINOIS

Sales Offices in Principal Cities

We give truck axles a brutal

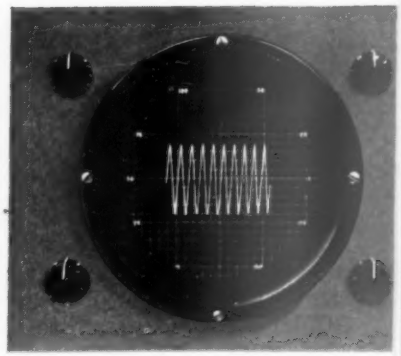
in the new Timken-Detroit indoor proving ground . . . and only

We torture them . . . shock-load, over-speed and jerk them . . . twist, strain and abuse them. We match every on-the-job hauling condition . . . then throw in a few devilish tricks of our own!

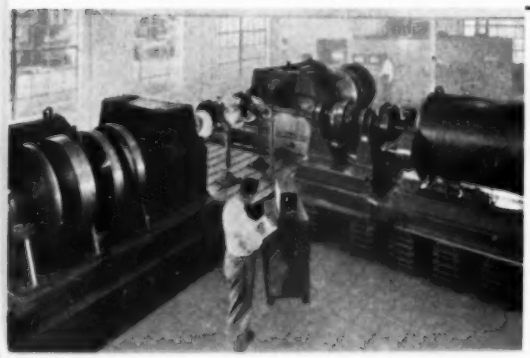
The result? You know for sure that *any* Timken-Detroit axle can take more abuse on the job it was built for than any other axle made!

To prove it, we moved a huge proving ground indoors. In one room we can simulate any hauling situation—our engineers can apply 50 years of experience to perfecting axles for modern trucks, buses and trailers, and measure performance with scientific precision.

This research pays off in longer truck life; less maintenance, repairs and downtime; lower operating costs. No wonder Timken-Detroit axles with Hypoid gearing rate "first" with wise truck owners!



Whatever you haul . . . simulated service conditions show up electronically on a screen like this. For instance—a heavily loaded truck on a bumpy, twisting road—then on a level express highway or long grade. What happens to the axle and gearing is measured, charted with absolute scientific accuracy.



TDA controls quality in this "Torture Chamber"

Here we simulate actual highway conditions . . . test quality and performance of axles under any hauling situation, such as duplicating the kinetic energy of 80,000 lbs., G.C.W., at 60 m.p.h. All tests are repeated hour after hour with an automatic cycling control.

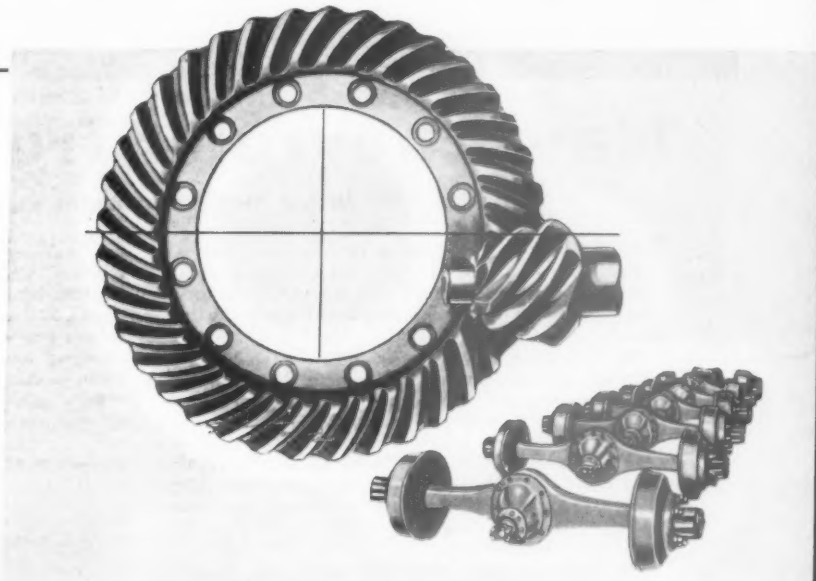
You're hauling gravel . . . you want truck axles with pulling power to get you out of the hole with a capacity load. You want steady, even power for long grades . . . speed on level road. You want all this at lowest r.p.m. *plus* easy, low-cost maintenance, economy of operation and little downtime. Timken-Detroit "Torture-Tested" axles are for you!

You're hauling wet concrete . . . you can't afford axles that "conk out" en-route. You want axles you know *for sure* will take off and get the mix to the job—*on time*—ready to pour. You don't want costly maintenance and repairs or shop-time. You want rugged Timken-Detroit "Torture-Tested" axles with Hypoid gearing. They save you money.

You're hauling sand . . . you want axles that can get the load up and out of anywhere . . . then speed it to the dumping area and get back quick. You don't want to beat your engine to death . . . or have profit-eating maintenance, repairs or downtime. You want axles that can stand up—Timken-Detroit "Torture-Tested" axles with Hypoid gearing.

beating

Timken has it!



TIMKEN Detroit AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

The Accepted D A *Standard*

TRADE MARK REGISTERED

"TORTURE-TESTED"
to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF AXLES FOR TRUCKS, BUSES AND TRAILERS

Next truck you buy . . .
insist on Timken-Detroit Hypoid gearing

Hypoid gearing for truck axles was pioneered by Timken-Detroit.

Proved in billions of ton-miles of actual operation. Designed to give the slower gear ratios necessary for modern engines without loss of strength. Pinion is bigger, stronger . . . bearings are larger . . . more teeth in contact reducing loading per unit of contact area. Torque transmitting capacity increased to step up performance and rugged power.

Get interchangeability, too!

Only Timken-Detroit has Hypoid gearing in a complete "family" of 7 basic axle capacities—in the entire range of medium and heavy-duty requirements. This advanced-related design incorporates the same features of construction and interchangeability in single-speed; single-speed double-reduction; and two-speed double-reduction final drive units.

Plants at: Detroit, Michigan
Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

New Chevrolet Trucks for '54

Loaded with brand-new advantages you need and want!

You'll get more work done in less time and at lower cost with new '54 Chevrolet trucks on the job. They bring you more new features . . . more big new advantages than any other truck on the road.

For example, you get new engine power in all models. The advanced "Thriftmaster 235" engine combines bigger displacement and higher compression with other new features to give you greater power and finer performance. The rugged "Loadmaster 235" engine offers increased strength and stamina for heavier trucking operations. The all-new "Jobmaster 261" engine* brings you extra reserves of high-compression power for hauling big loads on schedule.

In addition, you enjoy new and even greater operating economy. All three 1954 Chevrolet truck engines bring you the full benefit of thrifty high-compression power.

And there are many, many more new things you'll like about these great new Chevrolet trucks. New, roomier pickup and stake bodies let you haul more . . . save you time and extra trips. And they're set lower to the ground for easier loading and unloading. New truck Hydra-Matic transmission* lets you drive all day without shifting. It's offered not only on ½- and ¾-ton Chevrolet trucks, but on 1-ton models, too. New Comfortmaster cab with one-piece curved windshield and amazing new Ride Control Seat* offers the last word in comfort, convenience and safety.

Plan now to see your Chevrolet dealer and get all the facts about the new Chevrolet trucks for '54. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Most trustworthy trucks on any job!

CHEVROLET

ADVANCE-DESIGN TRUCKS

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

THREE GREAT ENGINES—The new "Jobmaster 261" engine* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. **NEW TRUCK HYDRA-MATIC TRANSMISSION***—offered on ½-, ¾- and 1-ton models. Heavy-Duty **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **DIAPHRAGM SPRING CLUTCH**—improved-action engagement. **HYPOID REAR AXLE**—for longer life on all models. **TORQUE-ACTION BRAKES**—on all wheels on light- and medium-duty models. **TWIN-ACTION REAR WHEEL BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—greater holding ability on heavy-duty models. **NEW RIDE CONTROL SEAT*** eliminates backrubbing. **NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES**—give increased load space. **COMFORTMASTER CAB**—offers greater comfort, convenience and safety. **PANORAMIC WINDSHIELD**—for increased driver vision. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—easier, safer handling. **ADVANCE-DESIGN STYLING**—rugged, handsome appearance.

**Optional at extra cost. Ride Control Seat is available on all cab models. "Jobmaster 261" engine on 2-ton models; truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.*

MORE CHEVROLET TRUCKS IN USE THAN ANY OTHER MAKE!

80% more gypsum
on rubber than with tracks

Harris and Allen, Avenal, California, contracted to remove 75,000-yds. of gypsum from the McPhaill Co. pit at Avenal Gap. To handle 95% of the job, they brought in a rubber-tired Tournatractor with a LeTourneau 11-yd. LS Scraper . . . also a 148 hp crawler-tractor with a LeTourneau 18-yd. FP Scraper.

Both units self-loaded the powdery material . . . then hauled 400′ to 800′ to a stockpile. With project more than half completed, Tournatractor and pan had moved 70% of total yardage . . . crawler and pan, 25%.

187 vs. 104 loose yds. hourly

Even on minimum hauls of 400′, Tournatractor's 19 mph speed enabled it to outproduce the 5 mph crawler by 80%. Both tractors self-loaded in 175′ to 200′, according to contractor records. Tournatractor heaped 11 loose yds. in less than a minute . . . crawler was only able to get 13 loose yds. into its bigger scraper in the same time. Haul of 400′, dump, and return of 400′ took Tournatractor 2 minutes . . . crawler, 5 to 5½ minutes. In a 50-minute hour, Tournatractor made 17 trips, for an hourly output of 187 yds. . . . the crawler, with its longer haul time, averaged only 8 trips, for an hourly output of only 104 yds.

In addition to boosting production, Tournatractor paid off in lower maintenance. Because 4 big rubber tires replace about 500 wearing parts of a crawler track assembly, unit needed less lubrication.

If you want to increase production and lower costs, it will pay you to contact your LeTourneau-Westinghouse Distributor *before you buy another tractor.* See Tournatractor in action on *your* work.

The recent purchase by Westinghouse Air Brake Company of the earthmoving and related business of R. G. LeTourneau, Inc., combines two firms which are world leaders in their respective fields. It brings together the earthmoving know-how of LeTourneau and the precision manufacturing and research experience of Westinghouse Air Brake. You can buy from this strong new company with even greater confidence than before.

Tournatractor—Trademark T-513-Q-b

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Here's the Machine for L

Be fair with yourself. Does your present loading method really give you the lowest cost for loading trucks?

Does it operate continuously, or does it depend on the zeal and skill of the operator?

Does it tie up your trucks unnecessarily during the loading operation? Or does it release them as rapidly as possible?

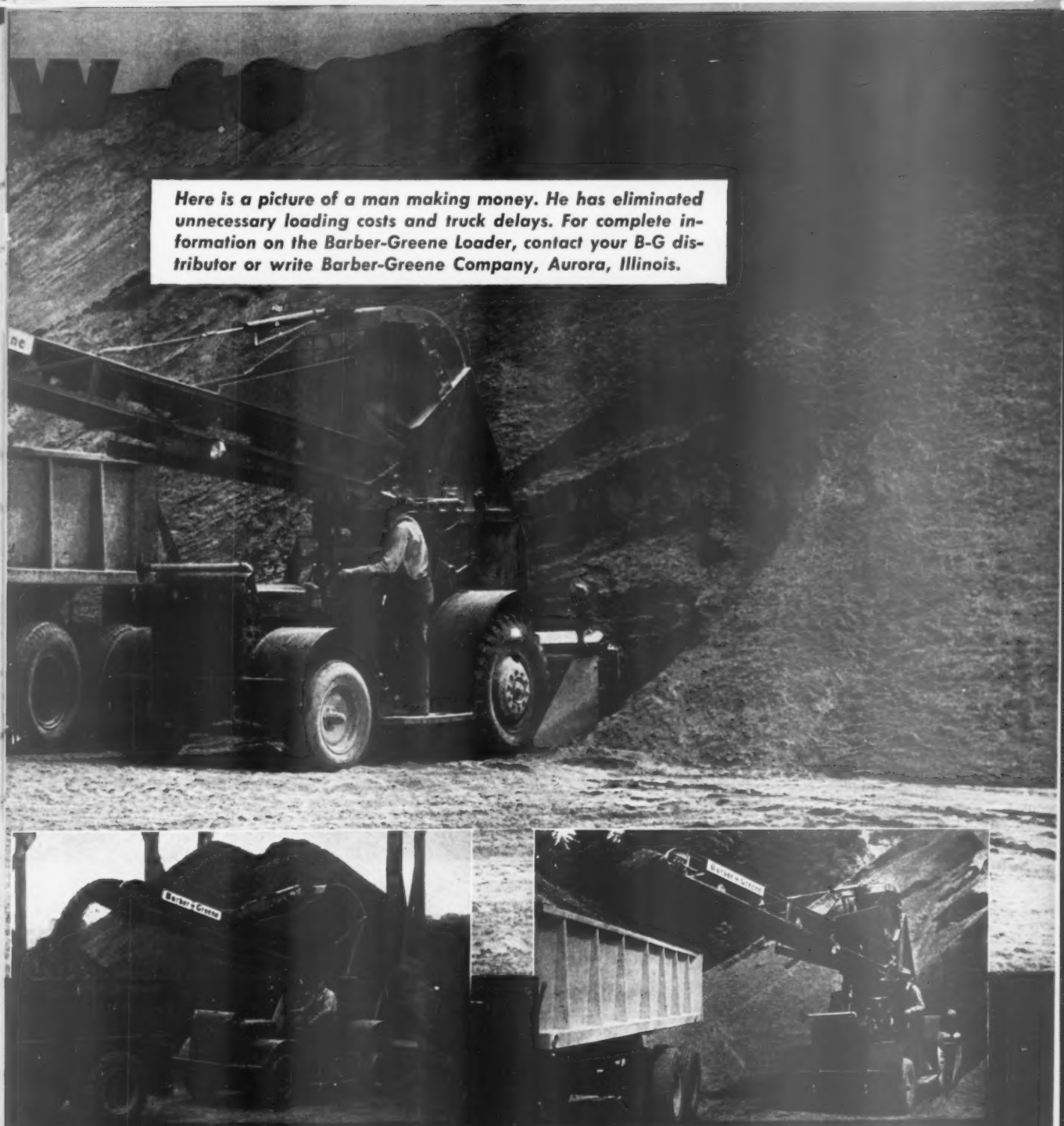
Remember your trucks are paying off only when they are hauling.

They don't pay you one dime while they are waiting to be loaded. In fact every idle second costs you money.

The Barber-Greene Model 543 Bucket Loader was designed to save loading time, truck time, and job time.

The Barber-Greene Bucket Loader is easily converted [illegible] If poor footing complicates your loading problem, the B-G Model 52A is the answer. Its Crawler-mounted operation enables it to load from stock piles, narrow truck beds with a quick swing.

see your **B-G distributor** ...or write



Here is a picture of a man making money. He has eliminated unnecessary loading costs and truck delays. For complete information on the Barber-Greene Loader, contact your B-G distributor or write Barber-Greene Company, Aurora, Illinois.

Barber-Greene

Aurora, Illinois, U. S. A.

No engine repairs in 12,300 hours!

The Caterpillar D13000 Diesel in this 1½-yard Link Belt Speeder dragline has needed two valve adjustments in more than 12,300 hours – and *nothing else!* "Not even cleaning the carburetor of the starting engine," says Bruce Harris, superintendent of Northern Virginia Construction Co.

This rugged Cat* Diesel loads 1800 yards of sand and gravel every ten-hour day, 24 days a month, the year around. "We have cold, damp weather from the ocean in the winter, and sand and dust in the summer, but our D13000 keeps on purring," Mr. Harris says. "We're really getting economical operation."

And, if you're interested in economy, here's more: all Caterpillar Diesels can deliver full power, and idle without fouling, on low-cost No. 2 furnace oil. And to cut costly down time to a minimum, your nearby Caterpillar Dealer is always ready to provide fast, skilled service and genuine factory parts.

There are 12 sizes of engines and electric sets to 500 HP and 315 KW. Leading manufacturers can supply Caterpillar power in their equipment; and when it's time to repower, it's time to see your Caterpillar Dealer. Ask him today for on-the-job performance *proof* of the dependable, pamper-free Cat Diesel that's best suited to *your* requirements.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

SPECIFY CAT POWER FOR HIGH-PROFIT PERFORMANCE

*Editor's page.....

Railroads Now Looking for More Tonnage as Profits Dip

AFTER A LONG PERIOD of piling up freight rate increases upon freight rate increases, some of the railroads in certain territories have decided that they can make profits at reduced tonnage rates. This change in thinking has come about all of a sudden, with a letdown in carloadings and profits. These railroads have taken the position that something must be done to slow the steady decline from railroad transportation to trucks.

While a general reduction in railroad freight rates is not yet indicated, there is widespread evidence of "selective reductions" in order to compete with truck transportation. A number of rate reductions have been put into effect and many more have been presented for approval before the Interstate Commerce Commission. Rate reductions on iron and steel as well as other commodities moving in certain areas have been of very substantial proportions.

The nature of railroad transportation is such that even a mild turndown in traffic has drastic effects on profits. In recent months, when carloading lagged about ten percent under the rate of a year ago, net income of railroads suffered to the extent of 31 percent.

The situation parallels conditions following the first World War when railroads piled on rate increases until the point of diminishing returns was reached and they finally recognized the need to reduce freight charges.

Apparently little was learned from that experience. Failure to prepare for the inevitable this time may have hurt the railroads far more than was the case 30 years ago. Truck transportation has been developed to a high degree since that time and many shippers and customers have had the opportunity forced upon them, to experience some of the benefits from good truck service. Railroad rate reductions for certain commodities may recover some volume but there is plenty of volume that will be found to have been permanently lost to other forms of transportation.

Case for Aggregates

The aggregates industries constitute a good case in point. Prices for sand and gravel and for crushed stone are among the lowest for any heavy commodity; yet, they have been subject to numerous increases in spite of the fact that the ton value of these commodities has, usually been less than the average cost per ton to ship them.

The National Sand and Gravel Association, from its very beginning, has been telling the Interstate Commerce Commission that railroad freight rates were too high and has continued to warn that sand and gravel tonnage was being driven to other forms of transportation. In spite of these warnings, the Commission has continued a practice of making sand and gravel subject to the same across-the-board increases as other commodities.

What has been the result? Even with a long series of rate increases, the railroads have found sand and gravel revenue to be no greater than it was 15 years ago, when total sand and gravel production was little more than one-half of present tonnage. Apparently they have been content to maintain the same dollar volume of income without attempting to take steps to gain some of the growing potential. In effect, it has amounted to charging more and more per ton for less tons in an endeavor to hold even.

Revenue Losses

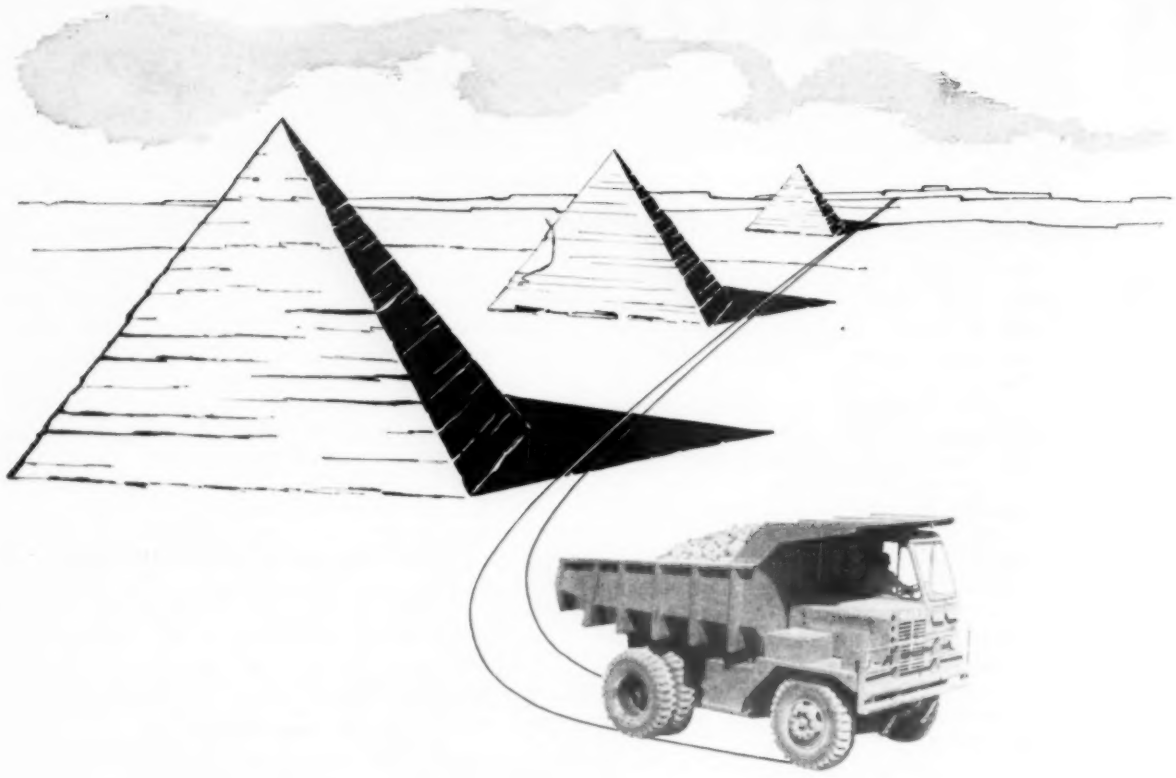
In 1938, some 40 percent of total commercial sand and gravel production was shipped by rail. In 1950, the railroads' share had dropped to 28 percent and was actually only 20 percent if non-commercial production were included. If the railroads had maintained the 1938 ratio, they might have transported some thirty-five million more tons of commercial sand and gravel than they did in 1950. The figure is even higher today. Similar conditions exist for crushed stone and others of the rock products, so the total adds up to many millions of dollars in freight lost.

In this movement to try to recapture business lost to trucks, the railroads would do well to cut rates for these low-priced, high volume materials as quickly as possible. Aggregates usually require single handling, and costs for handling on the part of the railroads are therefore much less than the average for all commodities.

Rate reductions of substantial proportion like those being granted for iron and steel would be effective in recovering some tonnage but, also important from the point of view of the railroads, might prevent some changeovers contemplated at producers' plants for the accommodation of trucks.

Many aggregates plants and cement plants have made substantial investments to change over for truck loading—because of high railroad freight rates—and are not going to discard them just for small concessions in the way of rate reductions.

Bror Nordberg



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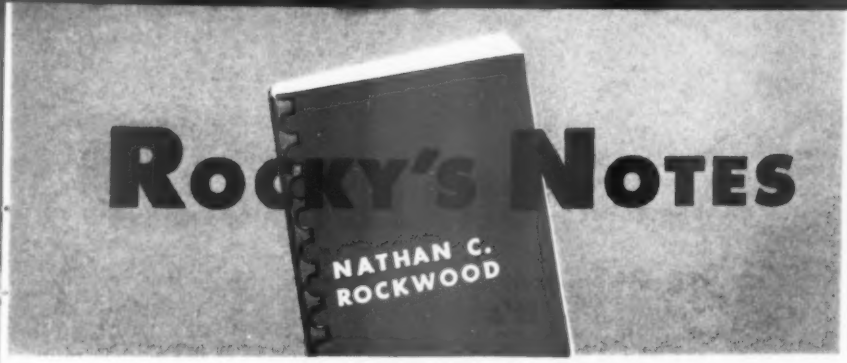

Ways to Estimate Bond Strengths of Minerals

ANYONE who has followed the discussions on this page and the articles on "Prospective Chemistry of Cement and Concrete" in our columns during the past year and a half must be convinced that the nature of chemical bonds between the elements in a molecule or in a colloidal or unit particle of a mineral, natural or synthetic, are explainable by the use of recent developments in structural, physical or crystal chemistry. That is about as far as a layman can go into the subject without a working knowledge of modern inorganic chemistry; but at least that much comprehension he must have if he is to understand the pending developments in this new knowledge of cement and concrete with which he will soon be confronted. For while we have been speculating on *what may develop*, competent scientists are already at work to utilize those developments in modern chemistry.

For those of our readers who may want to acquire a more detailed exposition of the whole subject of structural inorganic chemistry, we have before us a new American textbook, "Comprehensive Inorganic Chemistry"* by W. N. Lipscomb, P. R. O'Connor and G. T. Seaborg, the first two members of the faculty of the School of Chemistry, University of Minnesota, the third, of the School of Chemistry of the University of California. This is Volume I of a series to comprise 11 textbooks in all. To come are Volumes VII, Hydrogen and the Alkali Metals; VIII, Beryllium, Magnesium and the Alkaline Earth Metals, Boron, Aluminum, Gallium, Iridium and Thallium, and IX, Carbon, Silicon, the Metallic Borides, Carbides, Silicides and Related Compounds, Germanium, Tin and Lead. Those three volumes will presumably contain the more specific information on the elements and compounds which are of the greatest interest to cement and concrete researchers.

The initial Volume I which we have before us is, of course, an introduction to the ones that follow, and may well be read by those who have no wish to pursue the subject in such detail as will be required of scientists who intend to pursue this kind of research in the cement and concrete industries. The book is divided into three parts, the first comprising about half of the total: (1) Principles of Atomic and Molecular Structure, by Prof. Lipscomb; Theoretical and Applied Nuclear Chemistry, by Prof. O'Connor; The Actinite Series, by Prof. Seaborg. The first of these subjects is the one that all who wish to understand the future chemistry of cement and concrete and concrete aggregates must acquire some knowledge of. Naturally, the book is not written for laymen, but with such briefing on the fundamentals as we have endeavored to interest the layman in, we believe most of those really desirous of following the subject can soon acquire a sufficient understanding of what the science includes, to follow subsequent research progress.

*D. Van Nostrand Co., Inc., 250 Fourth Ave., New York City 3, 1953, price $5.00

Bond Strengths Important

It should be quite clear by now that the kind of bond and the bond strengths between elements, molecules and unit particles of any inorganic or mineral material are the all important factors which govern the strength, toughness and durability of the material. Until those factors are determined for cement, concrete and concrete aggregates, we shall still be stabbing more or less blindly at the right answers, based on a confusion of empirical data. That is not to say, of course, that a great deal of progress has not been made by the use of empirical data, but to our mind the time has come when we must go beyond the further accumulation of such data, and analyze what we have, and what will yet be accumulated, by the means of this fast developing science of structural or crystal chemistry. Even today, not enough is known *by anyone* to resolve such complex combinations as are to be found in hardened portland cement, or in concrete, into the exact type and strength of bonds, but a beginning is being made on methods to be followed, and most of us will have to go to a reading of up-to-date college textbooks to comprehend what is surely in the making.

Atoms and Molecular Structures

We have endeavored to explain in the simplest possible language the structures of a few elements of the most interest to those versed in the literature of cement and concrete. Combinations to form cement materials have been explained as the result of interaction between some of the outside-shell electrons (valence electrons) of adjoining atoms or molecules. That furnishes an elementary explanation of both how and why certain elements combine. However, there is, of course, a great deal more to these theories, than it is possible for us to explain. This becomes apparent when one attempts to analyze a complex mineral to determine what kinds of bonds hold it together, and how strong they are, not merely in resisting tensile and compressive stresses, but their resistance to further chemical reactions, such as we meet with in the weathering of concrete or in any other mineral product. When these questions are answered through the medium of modern structural chemistry, means will doubtless be developed for assuring bonds which are both strong and durable. The accumulated data of some half century on cement and concrete will then serve merely to illustrate and emphasize the cardinal principles which will have been developed.

Just to illustrate how the problem may be tackled, here is a brief quotation from the textbook at hand: "Attractive forces occur between each pair of atoms in a molecule, but by far the strongest bonds occur between adjacent atoms. Although bound atoms are in continual vibrational motion at all temperatures, each bond may be characterized in a given molecule by such quantities as average equilibrium distance between the nuclei [the central kernels of all atoms], one or more force constants, dissociation energy, etc . . . . It must be clearly realized that, because an average equilibrium distance is found, each bond must represent a balance between attractive and repulsive forces." The mechanical and mathematical theory for determining bond strengths follows in such detail as to provide a working knowledge for researchers in any branch of inorganic chemistry. There are, of course, other types of attractive forces between atoms, or between molecules, than the relatively simple ionic and covalent bonds we have described, but they are involved in conceptions such as the direction of spin of the pairing electrons, etc., which are difficult for the layman to grasp.

Crystal Chemistry Easiest

Fortunately in dealing with cement, concrete aggregates and concrete, we are concerned primarily with crystal chemistry, or in the case of cement before final hardening, with colloids which are either minute crystals or incipient ones. Such mineral crystal structures are fairly easy to study as having primarily electrostatic or ionic bonds, or partly covalent bonds which can be treated as ionic. Formulas are available by which bond strengths can be estimated because the size of the ions and the ionic radii can be determined, along with other

(Continued on page 99)

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LABOR RELATIONS TRENDS

Recommended Changes in the Taft-Hartley Act

By NATHAN C. ROCKWOOD

ON JANUARY 11, in his message to the Congress on his most desired legislation, the President included some 16 changes in the Taft-Hartley (or Labor-Management Relations) Act. Doubtless all our readers are familiar with this part of his message, and are in favor of most of the proposed changes, since they are obviously designed to correct faults. There probably will be some objections to the changes limiting the use of N.L.R.B. injunctions, and to restricting the application of the present prohibition against secondary boycotts, although the bald statement that: "The true secondary boycott is indefensible and must not be permitted" is reassuring. Our producer readers, however, would probably like to see spelled out in more detail the legalizing of a boycott, which "would shut town a construction job because of a dispute with one of several employers on the job site." For example, could a job be picketed to compel an aggregates producer serving that job to unionize *his* employes?

One laudable suggested improvement, and one that will be strenuously resisted by union labor bosses, is to provide for a government-sponsored, secret ballot by the interested workers before they can be called out on a strike. Many of our readers have had the experience of a strike called against them for some other purpose than the welfare of their own employes, who would have preferred to continue at their jobs. That it will seriously curtail arbitrary decisions by union politicians, for purposes of their own, is all too evident to them.

Another desirable change, and one in line with the previously announced purposes of this administration, is to return to the various state governments some jurisdiction over strikes and labor controversies which endanger the well-being of their own citizens. One of the most jealously retained safeguards by the framers of our federal constitution was the preservation of police powers to the local governments. For even before Hitler and Stalin, wise men were fully aware of the inherent dangers of a centralized police force. The establishment of the F.B.I. was in direct conflict with this constitutional provision, although up to this time, of course, there can be no criticism of the F.B.I. and the purposes it has served. Yet real students of, and lovers of and believers in, our federal constitution realize that the foundations are there to build up a very obnoxious state police.

President Eisenhower referred specifically to a recent decision of the U. S. Supreme Court, which in effect denies State Courts any jurisdiction over labor controversies that can be construed as covered by the Taft-Hartley or other federal laws. Not much publicity has been given this decision, but it is so crucial to this discussion that we believe our readers should be familiar with it. This decision was handed down by the U. S. Supreme Court, December 14, 1953, in the case of Garner et al trading as Central Storage and Transfer Co. v. Teamsters, Chauffers and Helpers Local Union (A.F. of L.).

State Courts Have No Jurisdiction

The essential features of the decision in the language of the court are as follows:

"A decision of the Supreme Court of Pennsylvania has deprived petitioners of an injunction which a lower equity court of the State had granted to prohibit certain picketing by respondent labor union. The court below reviewed the National Labor Management Relations Act and our applicable decisions, and concluded: 'In our opinion such provisions for a comprehensive remedy precluded any State action by way of a different or additional remedy for the correction of the identical grievance.' The correctness of this ruling is the sole issue here. We granted certiorari.

"Petitioners were engaged in the trucking business and had 24 employes, four of whom were members of respondent union. The trucking operations formed a link to an interstate railroad. No controversy, labor dispute or strike was in progress, and at no time had petitioners objected to their employes joining the union. Respondents, however, placed rotating pickets, two at a time, at petitioners' loading platform. None were employes of petitioners. They carried signs reading 'Local 776 Teamsters Union (A.F. of L.) wants Employes of Central Storage & Transfer Co. to join them to gain union wages, hours and working conditions.' Picketing was orderly and peaceful, but drivers for other carriers refused to cross this picket line and, as most of petitioners' interchange of freight was with unionized concerns, their business fell off as much as 95 percent. The courts below found that respondents' purpose in picketing was to coerce petitioners into compelling or influencing their employes to join the union.

The equity court held that respondents' conduct violated the Pennsylvania Labor Relati•ns Act.* The Supreme Court of the Commonwealth held, quite correctly, we think, that petitioners' grievance fell within the jurisdiction of the National Labor Relations Board to prevent unfair labor practices. It therefore inferred that state remedies were precluded. The dissenting judge thought the federal remedy inadequate, as a practical matter, because the slow administrative processes of the National Labor Relations Board could not prevent imminent and irreparable damage to petitioners. Since our decisions have not specifically denied the power of state courts to enjoin such injury, he thought the injunction should be sustained.

"The National Labor Management Relations Act, as we have before pointed out, leaves much to the states, though Congress has refrained from telling us how much. We must spell out from conflicting indications of congressional will the area in which state action is still permissible.

"This is not an instance of injurious conduct which the National Labor Relations Board is without express power to prevent and which therefore either is 'governable by the State or it is entirely ungoverned.' In such cases we have declined to find an implied exclusion of state powers. Nor is this a case of mass picketing, threatening of employes, obstructing streets and highways, or picketing homes. We have held that the state still may exercise 'its historic powers over such traditionally local matters as public safety and order and the use of streets and highways.' Nothing suggests that the activity enjoined threatened a probable breach of the state's peace or would call for extraordinary police measures by state or city authority. Nor is there any suggestion that petitioners' plea of federal jurisdiction and pre-emption was frivolous and dilatory, or that the federal Board would decline to exercise its powers once its jurisdiction was invoked.

* * *

Public and Private Rights

"This case would warrant little further discussion except for a persuasively presented argument that the

(Continued on page 135)

*The Pennsylvania statute does not specifically prohibit the type of union conduct charged in the complaint. However, the court reasoned that the union was attempting to force petitioners to violate § 6 (c) of the statute, which provides that "It shall be an unfair labor practice for an employer . . . (c) By discrimination in regard to hire or tenure of employment, or in any term or condition of employment to encourage or discourage membership in any labor organization . . ."

Why V-Belts with CONCAVE SIDES Last Longer!

(U.S. PAT. NO. 1813690)

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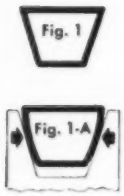
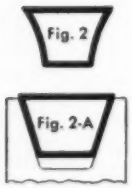
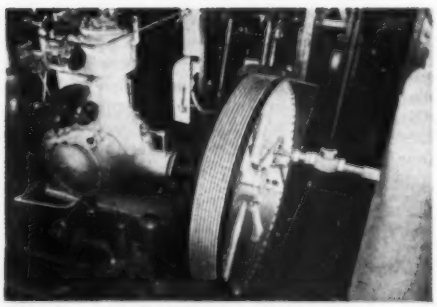


Take any *straight-sided* V-Belt (Fig. 1). Bend it—as it bends in going around a pulley. The sides will at once *bulge out* (Fig. 1-A). Clearly, those bulging sides will press *unevenly* against the V-pulley—and this causes *extra wear* at the points shown by the arrows (Fig. 1-A).

Now bend a Gates Vulco Rope with CONCAVE SIDES (Fig. 2)



Instead of *bulging*, the precisely engineered CONCAVE SIDES merely *fill out* to *fit exactly* in the sheave groove (Fig. 2-A). The sides press *evenly* against the V-pulley. All wear is distributed *uniformly* across the *full width* of the Gates Vulco Rope—and this means *longer* belt life and *lower belt costs* for you!



Typical Gates Vulco Rope Drive—the Gates V-Belts are built with Concave Sides to insure longer belt wear.

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PEOPLE in the news

Huron Appointments

ROBERT M. FISH has been appointed assistant secretary and assistant treasurer of the Huron Portland Cement Co. and the Huron Transportation Co., Detroit, Mich. O. R. Archer, who has been assistant superintendent of plants and vessels, has been given a special assignment under H. R. Schemm, vice-president in charge of operations. Charles L. Howlett has been transferred from the engineering department to vessel operations under C. M. Adams, superintendent of plants and vessels. Ralph E. Prine has been transferred to the accounting department. He was formerly assistant to F. E. Huber in the coal purchase department and will be succeeded by Joseph Sheridan, who was formerly with Wyandotte Chemicals Corp. E. C. Douglass has retired as auditor and office manager after 42 years of service but will continue to serve in an advisory capacity. He will be succeeded by Earl W. Denby, with the title of controller.

General Manager

CHARLES S. WARD, vice-president of the Nelsen Concrete Culvert Co., Champaign, Ill., has been appointed general manager of operations. He will continue as manager of the Mt. Vernon plant, which position he has held for the past 17 years. Fred M. Barncard has been named manager of the Champaign plant and secretary-treasurer of the company. He has been manager at the Champaign office for the past 13 years and assistant to E. P. Shapland, who passed away September 26 after 35 years of service with the company.

Heads Concrete Firm

RICHARD BUTCHER has been elected president of the Consumers Cement Block Co., Kalamazoo, Mich., to succeed Billie Marble, who has resigned. Other resignations include Adrian Klepper as vice-president; Jacob Bender as secretary; and Donald Thomas as a director. Pauline E. Butcher was elected vice-president; Edward Butcher, assistant secretary; and Clark Drake, who continues as treasurer.

District Engineer

DONALD H. HERAK has been appointed district engineer of the Spokane, Wash., office of the Portland Cement Association, Chicago, Ill. He succeeds Robert E. Tobin, who has resigned to accept a position as engineering consultant for the Spokane Concrete Pipe Co. Mr. Herak joined the P.C.A. in 1951 as field engineer in the Spokane office. After graduating in 1946 from Gonzaga University, Spokane, wtih a B.S. degree in civil engineering, Mr. Herak served with the Bureau of Reclamation as a construction engineer at Hungry Horse Dam in northwest Montana. He is a member of the American Society of Civil Engineers and the Washington Structural Engineers Society. He won first prize in the State of Washington for writing an outstanding essay for the General Motors recent Better Highway contest.

Awarded Citations

WALTER C. RUSSELL, president of Peerless Cement Corp., Detroit, Mich., Henry R. Schemm, vice-president in charge of operations of Huron Portland Cement Co., Detroit, Mich., and G. Donald Kennedy, executive vice-president of the Portland Cement Association, were recently awarded citations by the College of Engineering, University of Michigan, in recognition of their outstanding achievements and their contributions to the development of the field of engineering. The awards were made in observance of 100 years of engineering instruction at the University of Michigan.

Lime Firm Officials

RALPH S. LOCKE was recently elected president of the Diamond Springs Lime Co., San Francisco, Calif. R. B. Lawson was appointed assistant to the president; H. C. Green, general superintendent; William E. Flynn, treasurer; P. A. Flout, secretary; and D. F. Given, assistant secretary.

Ralph S. Locke

Association President

EDWARD I. WILLIAMS, president of The Riverton Lime and Stone Co., Inc., Riverton, Va., has been elected president of the Virginia Manufacturers Association. Born in Charleston, S.C., Mr. Williams graduated from Columbia University, New York, N.Y., with a degree in mining engineering. From 1914 to 1917 he was

Edward I. Williams

assistant superintendent and engineer of the General Chemical Co., subsequently becoming superintendent of the Gossan Mines. In 1925 he was appointed smelter superintendent of the Tennessee Copper Co., leaving there in 1930 to serve P. R. Mallory Co. in operations and sales. Two years later he joined the Riverton Lime and Stone Co. as sales manager and was elected president in 1941. Mr. Williams is a past-president of the Industrial Mineral Wool Association and of the National Mineral Wool Association. He served as a member of the board of directors of the Virginia Manufacturers Association in 1944-1945. He is a member of the American Institute of Mining and Metallurgical Engineers and the American Society for Testing Materials. During the war Mr. Williams was chairman of the Mineral Wool Industry War Council and a member of the lime industry advisory committee of W.F.A., O.P.A., and W.P.B.

On Board of Directors

WILLARD J. WRIGHT, attorney, has been elected to the board of directors of Pioneer Sand and Gravel Co., Inc., Seattle, Wash.

P. A. Groll

Lehigh Appointments

ROY N. YOUNG, who has retired as vice-president and operating manager of Lehigh Portland Cement Co., Allentown, Penn., is a native of Kansas and received his B.S. degree in mechanical engineering from Kansas State College. He started his career in the cement industry in 1915 when he joined the Western States Cement Co., Independence, Kan. He became associated with the Sandusky Cement Co. and later served as associate chemical engineer with U. S. Bureau of Standards. He joined Lehigh in 1924 and became chemical engineer in charge of process in 1931. In 1944, he advanced to the position of assistant vice-president and operating manager, and became vice-president in 1946.

P. A. Groll, who succeeds Mr. Young as vice-president and operating manager, is a graduate of Rensselaer Polytechnic Institute in chemical engineering. He joined Lehigh in 1925 as a chemist at the Alsen, N.Y., plant, later working on special assignments and in the research laboratory. In 1934, he was appointed chemist at the Oglesby, Ill., plant, subsequently becoming assistant superintendent and then plant manager. He was later appointed assistant operating manager in Allentown.

John Young

W. M. Harbaugh, who has retired as chief engineer, graduated from Park College with an A. B. degree, and then entered Massachusetts Institute of Technology where he received his B.S. degree. He joined Lehigh in 1919 as field engineer and in 1937 became head of the engineering department.

W. M. Harbaugh

Arnold J. Johnson

Arnold J. Johnson, now vice-president and assistant operating manager, worked in the Mason City plant for three years before completing his engineering course at Iowa State College. After receiving his degree in chemical engineering, he joined the chemical department in 1935. Five years later he was made supervising chemist and engineer of the Alsen, N.Y., plant. He was appointed combustion engineer in the engineering department in 1944, and plant manager of the Mason City plant in 1946. In 1951 he was named assistant operating manager.

Roy N. Young

John Young, retired director of employe relations, is a native of Colorado and received his education in United States, England and Germany. He became associated with the Chicago Portland Cement Co., at Oglesby, Ill., in 1915, as assistant superintendent. The plant was purchased by Lehigh in 1916 and one year later Mr. Young was appointed superintendent. He was transferred to the company headquarters in 1937 to become director of employe relations.

E. D. Meredith, who succeeds Mr. Young, has been assistant director of employe relations since 1942. He joined the Allentown office of Lehigh in 1912, and was appointed chief clerk of the Alsen, N.Y., plant in 1924. With the closing of that plant, he was assigned to the Sandt's Eddy plant temporarily, and was next appointed chief clerk of the Union Bridge plant in 1930. He was named

E. D. Meredith

assistant to the operating vice-president in 1936, and was appointed assistant director of employe relations in 1942.

Harold A. Butz, treasurer, started with Lehigh in 1919. He became chief clerk of the Buffalo sales office in 1921,

Harold A. Butz

a salesman in 1923, and district sales manager at Baltimore in 1925. He was appointed credit manager in 1936 and assumed the additional duties of advertising manager in 1945.

L. F. Lawrence, who becomes advertising manager, has been in ad-

L. F. Lawrence

vertising and sales work since he joined the western sales office of Lehigh in Chicago in 1928 where he remained until 1945 when he was transferred to the advertising department in Allentown.

Field Engineer

HARRY A. SMITH has been appointed field engineer for the Calcium Chloride Institute, Washington, D.C., and will serve the north-central area. Mr. Smith has had a great deal of experience in the laboratory and in field engineering, including soil mechanics work. His former positions were as assistant district soil engineer and in the testing laboratory of the Michigan State Highway Department. He was also with Ammann & Whitney, consulting engineers, where he assisted in the design of the Milwaukee Expressway System. He served 33 months in the U.S. Navy during World War II and received his M.S. degree in civil engineering from the University of Michigan, Ann Arbor, Mich.

On Board of Directors

HAROLD G. LEIBOLD has been elected a director of Silica Chemicals, Inc., Amherst, Ohio, subsidiary of Cleveland Quarries Co., Cleveland, Ohio. George S. Love has been named secretary and treasurer. Mr. Leibold has had 18 years of service with the parent company, as sales engineer and manager of refractory sales. Mr. Love has served as auditor, controller and assistant secretary in his 25 years with the firm.

On Sales Staff

WAYNE MULLIN has been named sales representative for Kaiser Gypsum Co., Oakland, Calif., in the Oroville, Calif., to Grants Pass, Ore., area. He will make his headquarters in Redding, Calif. Ed Ryan, who has been serving at the Long Beach plant, has been appointed to the Southern California district sales staff in Los Angeles, and Walter T. Smith, Phoenix, Ariz., has been assigned to the Arizona sales territory.

Heads Engineers Society

RALPH E. TOWERS, sales engineer for The Bessemer Limestone and Cement Co., Youngstown, Ohio, was recently elected president of the Mahoning Valley Society of Professional Engineers.

Cement Commission

RALPH J. MCNERNEY, Sioux Falls, S. D., has been appointed to the South Dakota Cement Plant Commission, according to an announcement by Gov. Sigurd Anderson, Pierre, S. D.

Merchandise Manager

V. R. BELDEN, formerly Midwest division sales manager, has been named merchandise manager of insulation products of the United States Gypsum Co., Chicago, Ill.

General Manager

LESLIE B. BELLAMY has been appointed general manager of the Sterling abrasives division, Tiffin, Ohio, of the Cleveland Quarries Co., Cleveland. He joined the division in 1944 as a technical field engineer and has been Detroit district manager since 1946.

50 Years of Service

W. C. HANNA, vice-president in charge of technical development, California Portland Cement Co., Colton, Calif., recently completed his 50th year as an employe of the company. For many years he was chief chemist. He began work with the company at 19 years of age.

OBITUARIES

CHANNING WILSON PARSONS, president and a founder of the Wausau Concrete Co., Wausau, Wis., died November 28 after a long illness. He was 66 years old. Born in Alma, Mich., Mr. Parsons graduated from the School of Engineering, Michigan State College, Lansing, Mich., where he also served as an instructor before establishing the Wausau Concrete Co. in 1919 in partnership with the late Ira J. Westerveld.

MRS. DORIS M. FARRELL, owner and operator of Mrs. H. T. Farrell Gravel Co., Dallas, Texas, died December 31 after a long illness. She was 55 years old. Following the death of her husband, Hunter T. Farrell, a few years ago, Mrs. Farrell took over and operated his gravel firm, changing the name to the Mrs. H. T. Farrell Gravel Co.

WILLIAM G. BRUNS, SR., president of the Eagle Sand and Gravel Co., Sioux Falls, S. D., died suddenly on December 31. He was 69 years of age. Mr. Bruns was also founder of the Bruns Construction Co.

CARL T. MONSON, president of the Wexford County Gravel Co., Cadillac, Mich., and manager and superintendent of R. W. Meyer Co., Traverse City, Mich., died December 15 at the age of 45.

OTTO W. RATH, sales manager for the Iowa-Wisconsin division of Marquette Cement Manufacturing Co., Chicago, Ill., died December 16. He was 59 years old.

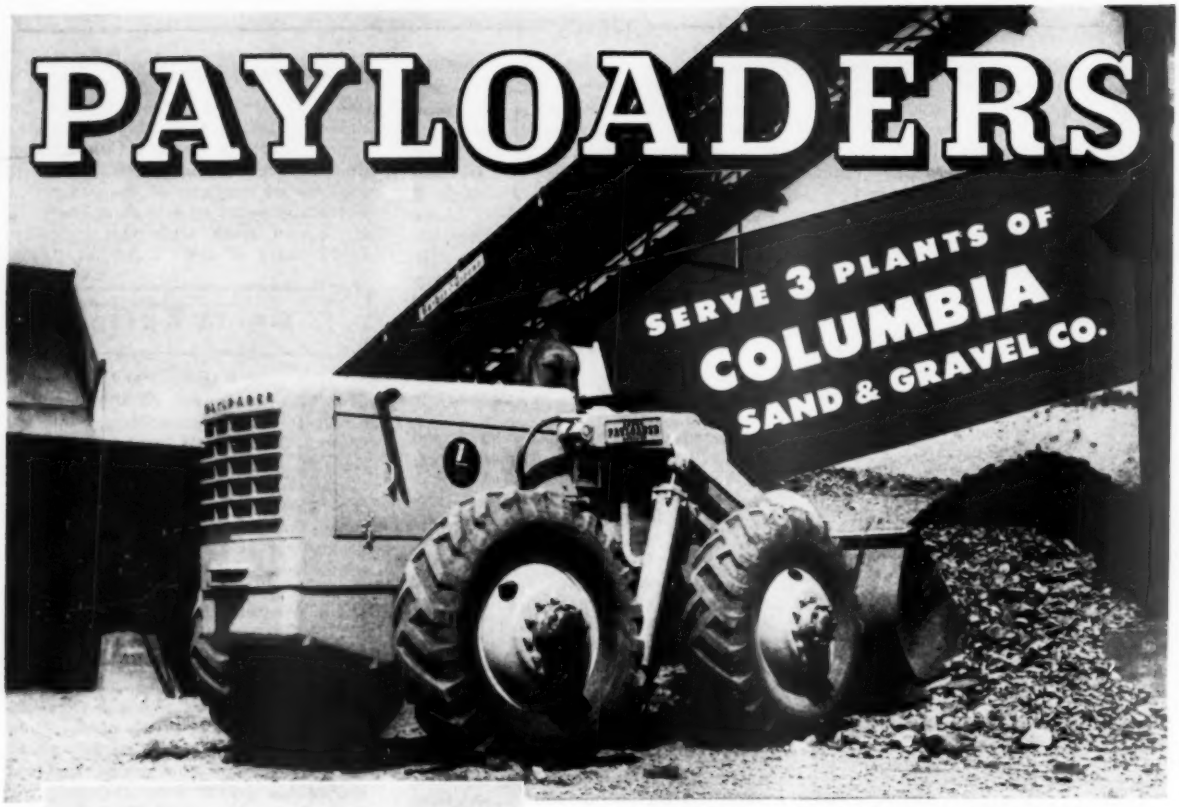
CHARLES P. MITCHELL, superintendent of the Monarch Cement Co., Humboldt, Kan., until his retirement in 1947, passed away January 13 at the age of 73.

ARCHIBALD H. DICK, retired vice-president of the Brazilian Portland Cement Co., Rio de Janeiro, Brazil, died January 16 after a brief illness. He was 66 years of age.

RICHARD H. WAGNER, a partner in the Henry Wagner & Son Cement Co., Denver, Colo., until his retirement a few years ago, died suddenly on January 8. He was 58 years old.

FRANK HEDGER, a partner in Hedger Brothers Concrete Products Co., Jonesboro, Ark., died suddenly on November 25 at the age of 37.

PAYLOADERS



HR "PAYLOADERS" at Columbia's Martindale and Philmont plants — two of their three "PAYLOADER"-equipped pits near Hudson, N. Y.

4 Wheel drive "PAYLOADERS" are pets at the three Columbia plants because they do so many jobs *well* and move fast from one task to another. They load trucks . . . trim piles . . . carry and dispose of oversize material . . . pull stuck trucks . . . serve as handy man-lifts for conveyor greasing and repair.

Superintendent William Lansing at Martindale says, "Our Hough 'PAYLOADER' makes the job of keeping our plant clean very easy. It is a dependable machine and economical to operate."

The operator says, "I like the smooth riding and the easy steering and good visibility."

The 1 cu. yd. Model HR is one of several sizes of "PAYLOADERS" serving cement mills, block plants, sand and gravel plants, crushed-stone and dimension stone quarries, as well as producers of other metallic and non-metallic materials.

There's only one "PAYLOADER", but there are 7 models of these distinctively outstanding tractor-shovels to fit *your* job. Your nearby "PAYLOADER" Distributor is ready to give you complete details. The Frank G. Hough Co., 705 Sunnyside Ave., Libertyville, Illinois.

FREE JOB STUDY

Here's an authorized job analysis of "PAYLOADER" operations in a pit producing a wide variety of sand, gravel classifications. Ask for job Study No. 20.

SAY "HUFF"

PAYLOADER®

THE FRANK G. HOUGH CO. • Since 1928

industry news

Cover Picture

ON THIS MONTH'S COVER is an illustration of the Quigley plant of Fort Worth Sand & Gravel Co., subsidiary of Texas Industries, Inc., located at Hurst, Texas. The main belt conveyor inclines up from the hopper to the washer and to six separate tower-like structures, with screens, over stockpiles of various sizes of sand and gravel. Capacity is 150 cu. yd. per hour. A reclaiming and blending tunnel conveyor is located beneath the stockpiles. This issue will contain the complete story about Texas Industries, Inc., Dallas, Texas, one of the most rapidly expanding companies in the rock products industry. It is one of the largest producers of manufactured lightweight aggregates, and includes, in addition to sand and gravel, crushed stone, ready-mixed concrete, concrete pipe, and concrete block in its operations.

Canadian Gypsum Products

CANADIAN PRODUCTION and sales of gypsum products showed a considerable increase during the first ten months of 1953, over production and sales during the same period of 1952, as reported by the Dominion Bureau of Statistics. Shipments of wallboard during the first ten months of 1953 totaled 205,029,981 sq. ft., compared with 184,412,535 sq. ft. for the same period of 1952; lath shipments totaled 228,183,382 sq. ft. for the 1953 period, as against 171,262,253 sq. ft. the preceding year; sheathing shipments amounted to 5,891,588 sq. ft. in the 1953 period and 4,324,745 sq. ft. in 1952; block and tile shipments totaled 124,337 sq. ft. in 1953, compared with 121,189 sq. ft. in 1952; and shipments of plasters amounted to 210,630 tons during the 1953 period, compared with 168,983 tons for the preceding year.

Stocks on hand at the end of the first ten months of 1953 were reported as follows: Wallboard, 5,380,467 sq. ft.; lath, 2,654,641 sq. ft.; sheathing, 568,820 sq. ft.; block and tile, 108,019 sq. ft.; and plasters, 1034 tons. This compares with 1952 10-month-end stocks of: Wallboard, 4,424,180 sq. ft.; lath, 1,945,467 sq. ft.; sheathing, 338,667 sq. ft.; block and tile, 118,992 sq. ft.; and plasters, 1204 tons.

Cement Expansion Program

CANADA CEMENT CO., Winnipeg, Manitoba, has announced a $10,000,000 expansion program for rebuilding and enlarging its operations in suburban Fort Whyte. The new plant is expected to be completed in about a year and one-half, doubling the present production capacity of 1,600,000 bbl. per year. Winnipeg requirements alone are expected to absorb the increased production, due to an anticipated major building boom in 1954. The project is said to be one of the heaviest capital spending programs ever made at Winnipeg by a private corporation.

Pakistan Cement

PAKISTAN is expected to achieve national self-sufficiency in cement production by 1955. A development program, currently being promoted by the Pakistan Industrial Development Corp., is expected to increase Pakistan cement production to over 1,000,000 tons annually. Two new cement plants, one at Hyderbad and the other at Dadukhel, are being established. The Hyderbad plant, which will have a 400-ton daily capacity, is being financed with the Colombo Plan aid received from New Zealand, and the Dadukhel plant with Canadian-Colombo Plan aid.

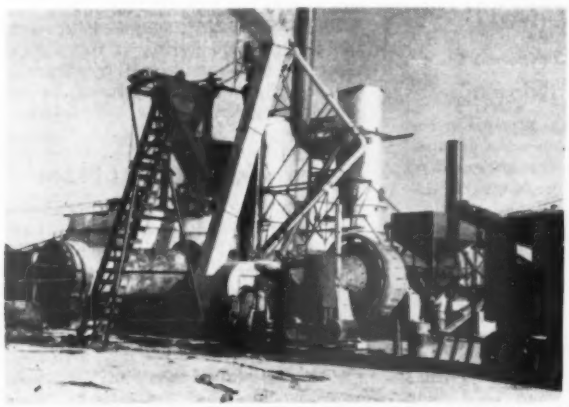
The development program will also include the expansion of the five existing cement plants, increasing capacity from the present 610,000 tons annually to over 800,000 tons.

Pumice Plant

PUMICE, INC., Idaho Falls, Idaho, at its recent annual stockholders' meeting, reviewed the company's business activities in 1953 and the plans and outlook for 1954. Activities in 1953 included the installation of a new processing plant for the production of "Volcolite" pozzolan, the company's new lightweight aggregate, said to be especially suitable for use in colored split brick and block. Trial shipments of the new aggregate to various parts of the country were said to have brought enthusiastic response.

The company plans to start immediate full production of pozzolan; insulation, traction and soil conditioning granules; and plaster, mortar and stucco aggregates, in addition to its present lightweight concrete aggregates. The new products are to be made available in both bagged and bulk shipments. Later in the year, additional new products will be added, including plaster, mortar and concrete mixes in bags, ready to use except for the addition of water.

Officers of the company are R. L. Milner, president; R. Neal McDonald, vice-president; Robert E. Lee, secretary; and C. G. Wyllie, treasurer.



Left: New processing plant of Pumice, Inc., Idaho Falls, Idaho. Right: A part of the company's 4000-acre pumice deposit

Vermiculite Plants

ZONOLITE CO., Chicago, Ill., has announced the acquisition of vermiculite processing plants in Elwood City, Penn., and in North Billerica, Mass. Announcement was also made of the opening of a processing plant at St. Thomas, Ont., Canada, by F. Hyde & Co., Ltd., processing distributor of Zonolite products.

The new plant at Ellwood City replaces the company's former plant at Sharpsburg, Penn. Paul W. Sylvester is district manager of the plant's territory, which includes western Pennsylvania, eastern Ohio, and parts of West Virginia.

The North Billerica plant, 18 miles north of Boston, will serve the New England area, of which Vernon E. Swan is district manager.

F. Hyde & Co.'s St. Thomas plant will serve western Ontario's major cities, including London, Sarnia, Windsor and surrounding communities.

These installations bring to 41 the number of vermiculite processing plants in the United States and Canada operated by Zonolite and affiliated companies.

Asbestos Option

DOMINION ASBESTOS MINES, LTD., Montreal, Quebec, recently announced that its stockholders have approved an agreement with National Gypsum Co., Buffalo, N.Y., under which National Gypsum will be granted an option to purchase the property and assets of Dominion. Stockholders also approved a by-law which would permit issuance of $3,000,000 of first mortgage bonds as required by the agreement.

National Gypsum Co. contracted to pay off obligations of Dominion Asbestos in return for a 90-day option to purchase all the assets of Dominion. National Gypsum will investigate the asbestos deposits during the option period.

Gypsum Plant

KAISER GYPSUM CO., INC., Oakland, Calif., has announced that construction of its new gypsum board and plaster plant at Seattle, Wash., will get underway this spring. The new plant, which will cost an estimated $4,000,000, will be the only one of its kind within 800 miles of the Puget Sound area, and will be built on a 9½-acre site on waterway property purchased by the company about two years ago. Facilities will include five main buildings and several auxiliary buildings. The plant is expected to have an annual payroll of $725,000 and employ 170 persons.

Kaiser Gypsum Co., a wholly-owned subsidiary of Permanente Cement Co., Oakland, Calif., currently is operating two gypsum products manufacturing plants at Long Beach and Red Wood City, Calif. These plants, as will the new Seattle plant, receive gypsum ore from the company's quarries on San Marcos Island, in the Gulf of California off Mexico.

New Phosphate Plant

ARMOUR CO. has started construction of a phosphate processing plant, adjoining the Armour Fertilizer Works plant, three miles west of Bartow, Fla. A complete washing and flotation plant, with storage and grinding facilities, is being built for the company by Frank M. Murphy & Associates, Inc., on designs prepared by Attapulgus Minerals & Chemicals Corp., Lakeland, Fla.

Plans for the project were announced a year ago by John E. Sanford, company president, when a $7,000,000 certificate of necessity was granted to the company. Construction of the building is expected to cost about $3,500,000, with the balance to be used for purchase and installation of machinery and other equipment.

Armour Co. was formerly one of the major phosphate-producing companies in Polk County, Fla., but closed down its operations in the late 1920's. After World War II, the company built its present fertilizer manufacturing plant, and has been buying phosphate rock from other phosphate companies for processing. The new washing and flotation plant is expected to be in operation within the next two years. Harold Hedrick, from Armour headquarters at Atlanta, is project engineer. General manager of the company's Polk County operations is E. C. Johnson.

Vermiculite Plaster Sales

DANIEL J. BOONE, vice-president of Zonolite Co., Chicago, Ill., recently predicted favorable 1954 sales trends for vermiculite. Increasing acceptance of lightweight construction and growing use of machine-applied plaster were among the factors reported. Other factors listed were: a well organized program of plaster promotion by elements serving the trade; tightening of the housing market, leading to more intensive selling of brand name features in houses; and rising air conditioning sales.

Mica Mining Shutdown?

A SHUTDOWN in mica mining in the Black Hills may face the area because of excessive costs to the government in the mica-purchasing program. Attention was focused on the problem with the release of a memorandum by W. M. B. Freeman, assistant to the commissioner of the Emergency Procurement Agency of the General Services Administration, in which he stated that the agency has paid out over $60,619 for mica obtained from the Black Hills in the last 15 months; that the government had paid $600 per short ton for handcobbed mica; and that, "based upon yield called for by the regulations, the mica is not worth more than $120 per short ton." Mr. Freeman suggested that processing at Custer, S. D., might be discontinued. The Custer Chamber of Commerce, however, has asked Mr. Freeman, before taking such action, to allow the miners more time to bring the quality of their mica up to the required specifications.

Acquires Plaster Plant

S. F. BARTLETT, president, Badger Perlite Products Co., Milwaukee, Wis., recently acquired one-half interest in American Plaster and Supply Co., Milwaukee. Allen J. Miles, district representative, National Gypsum Co., Buffalo, N.Y., has acquired the other half interest. Mr. Bartlett will be in charge of the plaster company, while Mr. Miles will continue with National Gypsum Co. American Plaster and Supply Co. has been producing plasters and plaster products in Milwaukee for the past 30 years and has also been a distributor for many other building materials manufactured by nationally known firms.

Canadian Potash

POTASH CO. OF AMERICA, Denver, Colo., has signed an agreement with the Department of Mineral Resources of the Province of Saskatchewan for the prospecting and development of potash deposits in the area of Princess Lake, east of Saskatoon. The agreement provides initially for prospecting in a 100,000-acre tract, to be followed by sinking of a production shaft and other facilities at a minimum cost of $3,000,000.

Potash Co. of America, which also operates mines and a plant at Carlsbad, N. M., first began investigation of the Saskatchewan deposits in April, 1952, at which time it took out its first permit authorizing preliminary investigation in a specific area. Later, nine other permits, covering other districts, were also obtaind. Saskatchewan is said to have the only known commercial deposits of potash in Canada.

The $3,000,000 development project, according to the terms of the agreement, is to be launched by May 1, 1956, with the expenditures to be completed within three years of that date.

Venezuelan Cement Plant

A NEW FIRM has been organized by Venezuelan interests for the purpose of establishing a cement plant at Chichiriviche Bay, State of Falcon, in western Venezuela. The plant, which will cost an estimated $2,000,000 and have a capacity of about 10,000 bags of cement per day, will supply the market in western Venezuela and possibly the Netherlands West Indies.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 22,529,000 bbl. of finished cement in November, 1953, as reported by the Bureau of Mines. This was an increase of 2 percent compared with the output in November, 1952. Mill shipments totaled 19,495,000 bbl., a decrease of 1 percent from the November, 1952, figure, while stocks were 48 percent above the same month in 1952. Clinker production during November, 1953, amounted to 22,489,000 bbl., an increase of 2 percent compared with the corresponding month of the previous year. The output of finished cement during November, 1953, came from 156 plants located in 37 states and in Puerto Rico. During the same month of 1952, 22,048,000 bbl. were produced in 154 plants.

Pavement Yardage

AWARDS of concrete pavement for the month of December and for the twelve months of 1953 are listed by the Portland Cement Association as follows:

	Sq. yd. awarded	
	During December 1953	During 12 months 1953
Roads	4,335,502	42,355,652
Streets & Alleys	2,121,265	26,272,711
Airports	147,982	9,939,915
Totals	6,604,749	78,568,278

Proposes Stock Split

THE BOARD OF DIRECTORS of Superior Portland Cement, Inc., Seattle, Wash., has recommended a two-for-one split of common stock and an increase of authorized common stock from 136,000 to 350,000 shares. According to a company official, the directors believe that a stock split would broaden the market for shares and increase the number of stockholders. A total of 135,854 shares are now outstanding. A two-for-one split would require 271,708 shares, leaving 78,292 shares for future issuance, under the plan.

Acquires Gravel Company

ALBUQUERQUE GRAVEL PRODUCTS CO., Albuquerque, N. M., has purchased the assets and equipment of Alexander Sand and Gravel Co., Albuquerque, owned by L. D. Alexander, a former employe of Albuquerque Gravel Products Co., who had left the company about a year ago to go into business for himself. The two companies merged operations November 1. Mr. Alexander has become manager of the Albuquerque Gravel Products aggregate plant.

Phosphate Plant

WESTERN PHOSPHATES, INC., Garfield, Utah, recently began operation of its new $5,000,000 phosphatic fertilizer plant, which has an initial capacity of 92,000 tons annually, according to John Paul Jones, vice-president and general manager. Triple superphosphate, phosphoric acid and ammonium phosphate are produced. Phosphate rock used at the Garfield operation is obtained from the Leefe, Wyo., mines. Elwood I. Lentz is plant manager. Wilson & George Meyer Co., sales agency for Western Phosphates, reportedly has already committed output of the plant for the first six months of operation.

Plans Dicalite Plant

GREAT LAKES CARBON CORP., New York, N.Y., has announced plans to build a plant on a 164-acre tract at Palos Verdes Peninsula, Calif., for mining and processing of diatomaceous earth. A "planned community" of between 10,000 and 12,000 homes was also announced by the company.

Acquires Talc Company

INTERNATIONAL TALC CO., INC., Gouverneur, N.Y., has purchased the holdings of W. H. Loomis Talc Corp., also of Gouverneur, as recently announced by S. W. Tuttle, vice-president, International Talc Co. The purchase will enable International to produce a greater variety of talc and discontinue plans to expand the present plant capacity, according to the announcement.

Turkish Cement Plant

A $3,000,000 CEMENT PLANT, which will have a 115,000-ton annual capacity, is being built at Ankara, Turkey. Operation on an experimental basis is scheduled to begin in September, 1954.

Lightweight Aggregate Plant

SOUTHERN LIGHTWEIGHT AGGREGATE CORP., Richmond, Va., recently announced that its subsidiary, Carolina Solite Corp., has reached a full 7-day-a-week operation schedule at its new lightweight aggregate plant at Aquadale, N. C. The plant, built at a cost of about $1,000,000 will serve the southeastern territory, including North and South Carolina, Tennessee, Georgia and Florida.

Coming Conventions

February 15-19, 1954—
National Ready Mixed Concrete Association, 24th Convention and Exposition, Conrad Hilton Hotel, Chicago, Ill.

February 15-19, 1954—
National Sand and Gravel Association, 38th Convention and Exposition, Conrad Hilton, Chicago, Ill.

February 18, 1954—
National Agricultural Limestone Institute, Board of Directors Meeting, Blackstone Hotel, Chicago, Ill.

February 19-20, 1954—
National Agricultural Limestone Institute, Annual Convention, Blackstone Hotel, Chicago, Ill.

February 22-25, 1954—
American Concrete Institute, 50th Annual Convention, Denver, Colo.

February 22-24, 1954—
National Crushed Stone Association, 37th Annual Convention and Manufacturers Division Exposition, Conrad Hilton Hotel, Chicago, Ill.

February 24, 1954—
American Concrete Agricultural Pipe Association, 4th Annual Convention and Meeting, The Fairmont Hotel, San Francisco, Calif.

February 25-27, 1954—
American Concrete Pipe Association, 46th Annual Convention and Meeting, The Fairmont Hotel, San Francisco, Calif.

March 3-4, 1954—
Iowa Agricultural Limestone Association, Ninth Annual Convention, Savery Hotel, Des Moines, Iowa

March 8-10, 1954—
Autoclave Building Products Association, 48th Annual Convention, Jefferson Hotel, St. Louis, Mo.

March 15-16, 1954—
Indiana Mineral Aggregates Association, Annual Meeting, Claypool Hotel, Indianapolis, Ind.

April 20-22, 1954—
National Industrial Sand Association, Spring Meeting, Boca Raton Hotel, Boca Raton, Fla.

May 3-5, 1954—
National Lime Association, Annual Spring Convention, The Homestead, Hot Springs, Va.

HINTS and HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Heavily Loaded Screen

AN UNUSUAL METHOD of feeding material to a screen is shown in the illustration. The chute, to the right, is feeding material from a screen

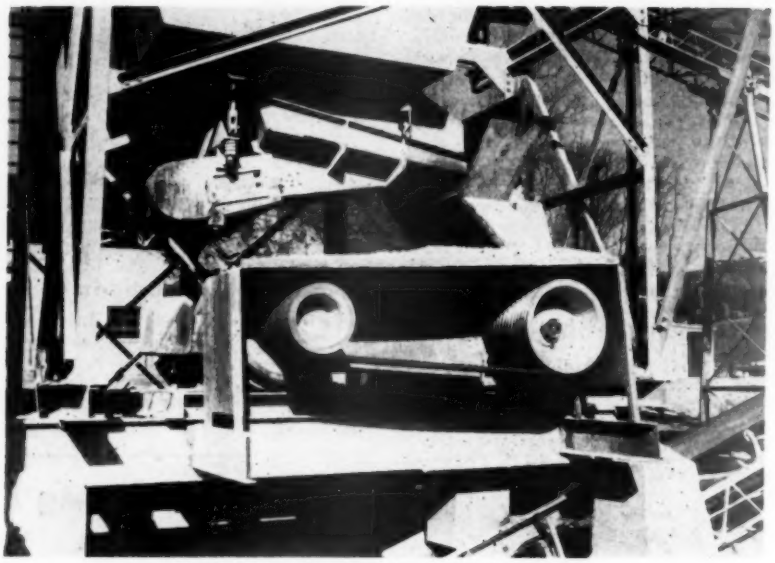
Feeding material to a screen from both ends

above the one shown. This chute, which carries material plus water, dumps to the low end of the following screen. By this method, dewatering is accomplished, and blending is achieved without rewashing material that is already clean.

Electric Feeder for Hammermill

ELECTRICALLY VIBRATED FEEDERS to supply material to a secondary crusher are not only efficient and practically fool-proof, but they lend themselves to simple and easy installation. The F-45 Syntron feeder, shown in the illustration, was installed at a new crushed stone plant in the East. Here the vibrator is used to feed the plus fraction from a scalper screen and a second vibrating screen to a 40-33 Cedarapids hammer mill.

Stone from the two screens falls to a steel stone box under which is mounted the feeder. This box takes the impact of the falling stone and changes its direction of travel 90 deg. Ahead of the primary crusher, the minus 2½ in. material is removed, using an electrically vibrated grizzly. This material can be rescreened for 2-A Modified or Pennsylvania Turnpike Modified, and any oversize can be sent by chute to the stone box



Electric feeder below stone box feeding hammer mill

ahead of the hammer mill. The plus fraction from the primary crusher is screened separately, and oversize from this screen may also go to the stone box. This set-up makes a neat and efficient operation, and does not require the quarry operator to strip too close.

Strip Overburden Underwater

WHAT IS BELIEVED to be the first operation of its kind, Dakota Sand & Gravel Co., Bismark, N. D., has installed a specially designed dredge to strip a 40-ft. layer of sandy clay and fines from the top of a deposit of coarse sand and gravel. The dredge is removing overburden at an average rate of 150 cu. yd. per hr.

The dredge, designed and built by Eagle Iron Works, is electrically powered and is equipped with a 10-in. dredge pump and a 45-ft. long "Swintek" dredging ladder. A traveling chain on the ladder acts as a screen to keep lumps of clay and debris from entering the intake nozzle and suction pipe, thus eliminating possible shutdowns. Cutter bars, located at intervals on the chain, agitate the deposit, thereby increasing the intake of solids.

Dredging installation of Dakota Sand & Gravel Co. removes overburden at average rate of 150 cu. yd. per hr.

Barge Loading

A NEW EASTERN SAND AND GRAVEL concern ships most of its production by boat. A system of long conveyor belts delivers from the plant to the loading dock. The illustration shows how two men load barges that hold

Loading spout at end of stacker boom has 300-deg. range, allowing full width of barge to be reached

from 600 to 750 tons each. The loading spout at the end of the stacker boom can be swung over a plus 300-deg. range, so that the full width of the barge can be reached by the spout.

Increase Crushing Capacity

AT A NEW CRUSHED STONE PLANT in eastern Pennsylvania, a 4- x 10-ft. double-deck scalper screen follows the 25- x 40-in. primary jaw crusher. The minus 1¼-in. material falls to the belt, shown to the right in the illustration, and the material is shipped out as 2-A Modified. This is a soil-stabilized type of highway material, and its use cuts down stripping requirements in the quarry. The plus 2½ to 6-in. stone is moved by belt conveyor to a 30-30 impact crusher, and its product is screened separately. The 1½ to 2-in. stone goes by belt conveyor to a 36-40 hammer mill alongside the impact crusher, but not shown in the illustration. The impact crusher produces 1, 1B, 2B, 3A and No. 4 stone. The hammer mill side produces 1, 1B and No. 2 stone. Coarser sizes are returned by belt conveyor to the impact crusher. The installation is Cedarapids equipment throughout. The plant is of the semi-portable type and operates without cover. The split feed from the scalper gives higher capacity and greater flexibility.

Hammer mill and impact crusher installed alongside each other

Launder to first unit has screen in bottom so that some of the coarser sand may pass to second unit which prepares the masons sand

Sand Recovery System

AN EFFICIENT SYSTEM of recovering two sizes of sand has been installed in a new eastern sand and gravel operation. Masons sand is recovered from a 30-in. x 25-ft. twin screw dewatering unit and concrete sand from a 24-in. x 20-ft. unit. The launder from the vibrating screen following the scalper screen is about 2 ft. wide and carries the minus ¼-in. pulp. This launder delivers to the smaller twin screw that prepares the concrete sand. Near the low end of the launder, a piece of wire cloth has been installed so as to form a part of the bottom of the launder. The size of this screen, though nominally ⅛ in., can be changed to fit specification requirements. The pulp from the ¼-in. screen flows down the launder, with most of the material going into the concrete sand machine. Some of the pulp, however, passes through the ⅛-in. screen which, with the finer overflow from the 24-in. screws, flows to the larger twin screw which prepares the masons sand.

Maximum Use of Scales

WHERE TRUCK SHIPMENT tonnage is large one operator solved his problem by locating a scale on each side of the office. With this arrangement,

Two scales speed up truck shipments

there are no delays to trucks. Should there be need for making scale repairs or adjustments, a spare scale is available.

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LUVERNE BLOCK CO., Luverne, Minn., has been sold by A. P. Fitzer to Gay Maxwell and Sons. Ronald Maxwell is the new manager.

NEW Machinery

Dragline-Lifting Crane

OSGOOD-GENERAL, P.O. Box 515, Marion, Ohio, has brought out the Model 327 1-cu. yd. dragline or 17-ton lifting crane. Features incorporated in the manually-controlled machine include roller-bearing mounted hoist drums; roller-bearing mounted

Dragline has 1-cu. yd. capacity or 17 tons as a lifting crane

hook swing rollers; anti-friction bearings on super-structure main shafts; independent boom hoist, with power up and down; enclosed deck gears, machine cut gear teeth; and flame hardened gears where extra stress occurs. The swing gear in the crawler frame is made separate from the crawler frame. The deck machinery is readily accessible, and any of the principal superstructure shaft assemblies can be removed without disturbing the other assemblies. Boom ininserts of variable lengths are available, and two types of fairlead are offered, whether of the standard swing or optional revolving type. Optional features also include independent travel; torque converters and fluid couplings; rapid folding and backhitch high gantry; boom stops for safety; different widths of tread belts; and various combinations of boom point sheaves.

Spherical Roller Bearings

SKF INDUSTRIES, INC., Dept. 616A, Philadelphia 32, Penn., has improved the design of its spherical roller bearings, to provide a reported increase of anti-friction bearing capacity from 25 to 50 percent, and service life from two to three and one-half times longer than formerly possible, without changes in the bearing size and weight. The improved design, designated "C" type, is available in series 222 and 223. The inner race is designed without undercuts and integral flanges, increasing capacity with longer rollers, providing more effective contact between the rollers and rings. Each row of rollers is held in a window-type cage of high-tensile-strength, cold-rolled brass. Where combined loads are present, the spherical bearing is said to be capable of carrying heavier combinations of radial and thrust loads, or pure thrust loads of greater magnitude. The bearing is interchangeable with older types size by size.

Heavy-Duty Trucks

THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis., has announced a line of heavy-duty, four and six-wheel drive trucks, featuring Math-Matic design which is said to produce a mathematically correct proportioning of truck weight and power between the front and rear wheels. A Rigi-Tapered frame with a deep taper design is said to make the front end rigid for mounting equipment and to provide equal load distribution. Also incorporated are a full-floating rear axle; a trunnion-mounted radiator, isolated from the frame by rubber; rubber-cushioned engine mountings; valve-in-head engines; diesel engines available for all models; a 12-volt electric system; Hevi-Duty steering gear with optional power steering; Stir-rup-Action clutch and brakes with the clutch hydraulically assisted and the brakes power assisted.

Hyraulic Scoop

THE YALE & TOWNE MANUFACTURING CO., Yale Materials Handling Div., Philadelphia, Penn., has developed a hydraulic scoop attachment which provides controlled dumping at any desired discharge rate and elevation up to the maximum lift height of the truck. The unit picks up,

Hydraulic scoop attachment handles free-flowing materials

transports and dumps free-flowing bulk materials. Actuated by a double-acting cylinder and with the truck uprights vertical, it provides a 38-deg. dumping angle down from the horizontal together with a 37-deg. backward angle for handling loads without spillage.

Hydraulic Hoist

THE HEIL CO., Milwaukee 1, Wis., has started production of a twin cylinder Model 2426 hoist, specifically designed for use on 8- x 17-ft. platform bodies and 8- x 10-ft. dump bodies. The hoist has a 50-deg. dumping angle, and the space from the top of the truck chassis to the bottom of the body is $9\frac{13}{16}$ in. for an easy loading height. It may be used with a dump body if the frame has no "kick-

Twin cylinder hoist has a 50-deg. dumping angle

up" and if the outside width is 36 in. or less. The payload capacity of the hoist when used with a platform body ranges from 6¼ to 3¼ tons; when mounted with a dump body, the payload capacity ranges from 5½ to 4¼ tons.

Lighting Plant

KATOLIGHT CORP., 624 N. Front St., Mankato, Minn., has added three models to its line of lighting plants. The generators are self-excited, two-pole design and are directly attached to the engine crank shaft, generating 60 cycle a-c current. The 1350 watt size is a 9FB Briggs and Stratton air-cooled model. The series is also available in a 650- and 2000-watt size. The engine will run on kerosene, or may be arranged with a two-compartment tank, starting on gasoline and running on kerosene. The complete unit weighs 146 lb., and is equipped with rubber-mounted type isolators, receptacles and carrying handles.

Vibration Detector

GENERAL ELECTRIC Co., Schenectady 5, N.Y., has announced a highly sensitive, crystal-type accelerometer, designed as a basic detection element for use in measuring vibration acceleration up to 50 G's in large rotating apparatus. The vibration detector may

Highly sensitive, crystal type accelerometer for large rotating equipment

be used on turbine generators, large motors, blowers, steam and gas turbines and centrifuges. Critical elements, such as the barium titanite crystal stack and components, are shielded by a cup-shaped end mass which helps guard against change of sensitivity in most corrosive atmospheres. Sensitivity is approximately 0.9 volts per G. Minimum lateral or torsional sensitivity helps provide reliable measurement, due to rigid support in these directions.

Power Steering Control

AIR-O-MATIC POWER STEER CORP., 24 Noble Court, N. W., Cleveland 13, Ohio, has announced a control valve which permits truck operators to select the degree of steering assist, at the flick of a finger, when connected with the Air-O-Matic power steer booster. It is mounted on the truck steering column for either right or left hand operation, and may be installed on old or new vehicles without altering or removing any part of the steering mechanism. Only one air line is required.

Heavy-Duty Tractor Loader

THE EIMCO CORP., Salt Lake City, Utah, has announced its entry into the heavy machinery field with the "105," a tractor loader of all steel construction, available with excavating attachments and other tools. Its features include "Unidrive" transmission, a compact unit containing the gearing and clutches for speed changing and full reversal of each track, and hydraulically actuated, friction-type clutches with sealed oil bath, pressure lubrication of all wearing parts.

Standard equipment includes rear power take-off; steel cab; electric starting; heat-treated alloy steel cast track shoes; crankcase guard; heavy duty front idlers; all steel transmission and drive cases; and standard SAE drilling for mounting attachments. The tractor is designed for full oscillation of tracks, even when the loading attachment is used.

The loader is driven from the engine front power take-off, and has a two-speed transmission. The loader utilizes rocker-arm loading action to provide an efficient loading cycle with more thrust in digging. The complete unit weighs 34,000 lb., and buckets are available in capacities of 1¼ and 1½ cu. yd.

Pulverizing Service

MAJAC ENGINEERING Co., Blawnox, Penn., has established a custom grinding service for industry, which includes complete laboratory and testing functions, if necessary, prior to volume production. The concern uses two Jet pulverizers, with a total capacity of 4000 lb. of material per hr., and grinds materials, such as limestone, clays, graphite, feldspar, alumina, chemicals, etc. The service is designed for pilot work for large volume, and for processors whose volume does not warrant the installation of large commercial pulverizing equipment. Precise control of fineness may be obtained, as well as exact particle size distribution or concentration of the end product into various predetermined percentages of different micron sizes.

Wet or Dry Sampler

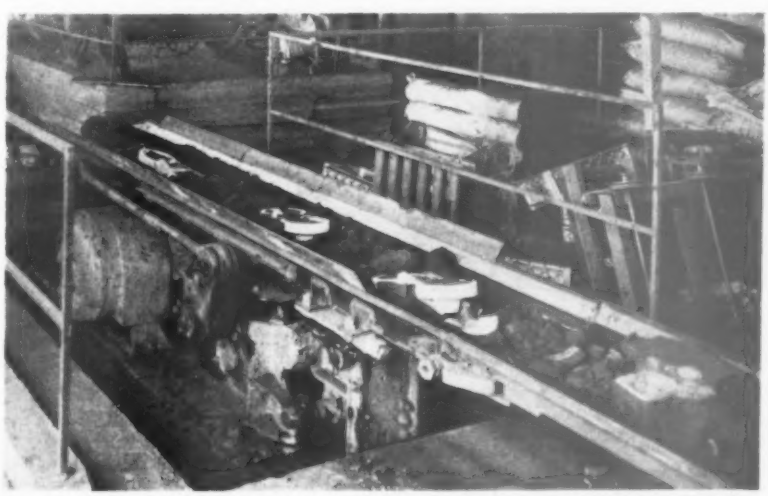
DENVER EQUIPMENT Co., 1400 17th St., Denver 17, Colo., has introduced the "Automatic Sampler," a 21-in. unit for wet or dry sampling. The wiring is enclosed in flexible coupling, and the time switch, and terminal connections are in one enclosure. A gear motor operates at intermittent intervals controlled by a motor-driven time switch which may be set for intervals varying from 2 to 55 min. in one minute intervals. A positive drive

Sampler uses only one limit switch, eliminating complicated wiring circuits

roller chain moves the cutter assembly on ball-bearing wheels along the carrier track to eliminate sliding contact between the cutter and carrier, thus assuring more accurate sampling and less maintenance. A magnetic operated heavy-duty motor brake prevents over-travel of the cutter.

Shaker Conveyor

GOODMAN MANUFACTURING Co., Halsted and 48th Sts., Chicago 9, Ill., has announced the availability of a full line of shaker conveyors for hot or abrasive materials. The conveyors move materials horizontally, upgrade or downgrade for distances up to 500 ft. Several materials can be transported separately, with the feed and discharge arranged at various points along the trough. The conveyor is metal reinforced, yet is lightweight and portable, with a normal capacity of 100 t.p.h. It can be powered by 10, 15 or 20-hp. electric motors, or 10- or 25-hp. air motors, and can be supplied with trough sections ranging from 12- to 36-in. widths, 6- to 16-ft. lengths, and 6- to 18-in. depths. Angle sections are available for operations in which the trough line turns.



Hot or abrasive materials conveyor for cement, lime, gypsum, quarry and mining industries

Tractor-Shovel Line

CLARK EQUIPMENT CO., Buchanan, Mich., has introduced the "Michigan Tractor Shovel" line. It will consist of six front-end loader or tractor shovel models: 12-B, with 15-cu. ft. capacity, bucket drive, and rear wheel

Model 75-B has 1-cu. yd. capacity, bucket drive, and rear wheel steering

steering; 75-B, with 1-cu. yd. capacity, bucket drive, rear wheel steering; 75-R, with 1-cu. yd. capacity, rear wheel drive, bucket steering; 75-A, with 1-cu. yd. capacity, four-wheel drive, rear wheel steering; 125-B, with 1⅝-cu. yd. capacity, four-wheel drive, rear wheel steering; and 175-A, with 2¼-cu. yd. capacity, four-wheel drive, and rear wheel steering. The models will utilize a transmission, designed by the company, which incorporates a torque converter with a three to one torque multiplication factor. It is a constant mesh type with full-pressure lubrication, and is operated from two manual control levers on the steering column. Another lever emerging through the floor board controls the overdrive.

Traction Lugs

BARABOO MANUFACTURING CORP., Baraboo, Wis., has brought out Miracle Traction lugs which provide extra wheel weight when attached, and which are said to provide up to 160 percent increased drawbar pulling power. The lugs are fastened to the rear wheels and extend out to 3½ in.

Lugs fit on tractor wheels for added traction and can be snapped to the wheel center for normal use

beyond the tractor tire with no rubbing or wear on the tire itself. The lugs become a permanent part of the wheel when attached, and provide geared-to-the-ground-gripping power for forward pull. They are said to outlast the tractor and increase the tire life by about 400 percent by decreasing slippage. The lugs snap open for use, a steel spring and automatic lock holding them in position. When through, they snap shut to the center of the wheel and the tractor is ready for normal use. The units fit all wheel-type tractors with 28- or 38-in. tires.

Self-Propelled Scrapers

WOOLDRIDGE MANUFACTURING CO., Sunnyvale, Calif., has introduced two open bowl Terra Cobra self-propelled scrapers, Model TH-090B with a heaped capacity of 15 cu. yd., powered by a Cummins diesel engine of 180 hp., and Model TH-090 with a heaped

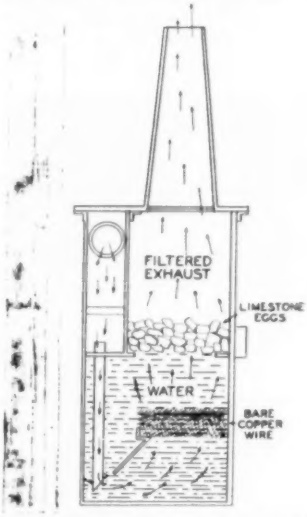
Open bowl scraper with positive hydraulic steering

capacity of 13-5 cu. yd., and a 165-hp. diesel engine. Basic design characteristics are similar to the 18-cu. yd., 225-hp. Model TH-0142, including positive hydraulic steering, air-actuated, direct-connected power control unit, "boiling bowl" loading system, positive "Roll-Out" ejector, and an 11-in. base diameter vertical oscillating king pin coupling between scraper and tractor units.

Both models have a high ground clearance, wide apron opening, short turning radius, and stability in all turning positions. All major components are accessible without disturbing unrelated parts.

Diesel Equipment Scrubber

CATERPILLAR TRACTOR CO., Peoria 8, Ill., recently announced that a steel plate box scrubber is being manufactured by The Landis Steel Co. of Picher, Okla., to provide safe operation of Caterpillar D2 or D4 diesel equipment in non-gaseous mines. A stainless steel scrubber is being put out by The Ruth Co. of Denver, Colo. The scrubbers remove aldehydes and a portion of the carbon monoxide from the engine exhaust gases by use of an exhaust gas conditioner. The remainder of the carbon monoxide and oxides of nitrogen can be dissipated in the mine atmosphere by adequate ventilation of the mine working areas. The scrubber also reduces the exhaust gas temperature to about 180 deg. F. According to authorities, ventilation of the mine should be such that the overall oxygen content, where diesel engines are operating, is not depleted more than 10 percent. The engine exhaust is piped from the exhaust manifold to the scrubber where



Schematic drawing of exhaust scrubber for diesel driven machines suitable for underground mining operations

it is baffled through water and then over a copper wire network and limestone rock. The box is filled to liquid level every four hours and drained and refreshed every shift.

Because of stringent U. S. Bureau of Mines recommendations for underground operation in gaseous mines, acceptibility of any piece of equipment for use underground must be established with state and local safety agencies.

Industrial Engines

REO MOTORS, INC., Industrial and Marine Engine Div., Lansing, Mich., recently entered the industrial power plant field with a line of six-cylinder, four stroke cycle engines of 292- or 331-cu. in. displacements, or twin six-

Radiator-cooled, power take-off engine for liquefied petroleum gas

cylinder 331-cu. in. units. Maximum basic engine output for the units at 2500 r.p.m. is 105, 120 and 240 hp., respectively.

Side-Dump Trailer-Tractor

EASTON CAR & CONSTRUCTION CO., Easton, Penn., has announced the Model TD-1832H side-dump trailer, which is built for operation with the Caterpillar DW20 tractor. The trailer utilizes large single tires, and has a low center of gravity and outboard-mounted hydraulic jacks to assure lateral stability, even while dumping on the run. Dumping is to one side only, but interchangeable mounting of the body and jacks permits reversal of the dump direction. A patented door mechanism operates automatically as the body is raised or lowered.

While the maximum dumping angle is 50 deg., the door becomes flush

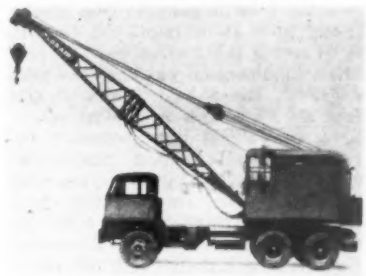
Side-dump trailer is coupled with a tractor for off-highway hauling

with the floor at 20 deg., forming a chute to discharge the load clear of the running gear. In the fully dumped position, the door can ride up and down over a windrowed load without injury to the operating mechanism. The body and trailer are of formed and welded construction, using a ⅜-in. plate, with an oak cushion and a ½-in. liner plate to reinforce the floor. The trailer frame is of the gooseneck, torque-beam type, open front and rear for self-cleaning of spilled materials. Standard equipment includes Bendix-Westinghouse air brakes with a relay-emergency valve and reservoir. Tires of either the rock lug type or for earthmoving are available.

The equipment is available through all Caterpillar dealers, and marks the first time Easton has departed completely from a direct sales policy.

Motor Crane

THE THEW SHOVEL CO., Lorain, Ohio, has introduced two additions to its line of Moto-Cranes, model MC-254W in the "TL" Series, with a lifting capacity of 17½ tons, and model MC-424 with a lifting capacity of 22½ tons. Model MC-254W is a three-axle unit available as a ¾-cu. yd. shovel, crane, dragline, clamshell, hoe or 1¼-cu. yd. scoop shovel. It has an overall width of 106 in. for additional lifting capacity without the need for outriggers. Maximum boom length with the tip extension is 95 ft. The unit can travel up to 37 m.p.h., has eight forward speeds, and two reverse, and is equipped with air



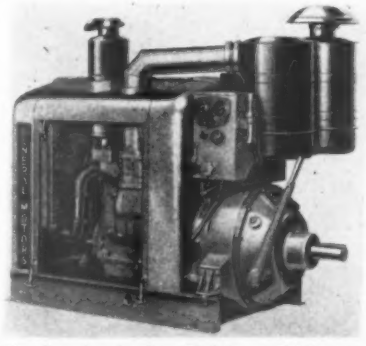
Crane has a lifting capacity of 22½ tons and a boom length of 125 ft.

brakes. It is available with diesel or gasoline power for the turntable and carrier, and with a front driving axle, third drum and other accessories.

Model MC-424 is a two engine model with a gasoline-powered turntable or super-structure mounted on a three-axle carrier, and drive on the two rear axles. It is powered by a separate gasoline engine at 10 forward speeds and two reverse, up to 27 m.p.h. The carrier has an overall width of 96 in. and is also equipped with air brakes. Maximum boom extension is 125 ft.

Valveless Power Package

GENERAL MOTORS CORP., Detroit Diesel Engine Div., 13400 W. Outer Drive, Detroit, Mich., has added a valveless diesel power package, developing 76 b.hp. at 2500 r.p.m., and weighing 1450 lb., to its industrial engine line. It is one of the "4-51" models, and is especially adaptable for use on rock crushers, small shovels, air compressors, pumps and other equipment where power in a compact package is desired. It is of two-cycle design with a blower forcing fresh air into and exhaust gases out of the cylinders. It has four cylinders arranged in line, and is a "square" engine with a 4.1-in. bore and 4.1 in. stroke. Compression ratio is 18 to 1, and the engine utilizes automotive-type electrical push-button starting. Valves and valving mechanisms have been eliminated through the use of intake and exhaust ports in the cylinder liners, a pneumatic-type governor with no rotating parts, and a lubricating oil pump built around the crankshaft thereby eliminating the need for a gear or chain drive on the assembly. The engine, including base, radiator, air-cleaners and clutch, measures 54 in. long, 28 in. wide and 48 in. high.



Diesel engine develops 76 b.hp. at 2500 r.p.m and weighs 1400 lb.

Distilling Salamander

CALIFORNIA HEATER CO., 1511 W. 2nd St., Pomona, Calif., has announced the availability of a salamander with a flame spreader inside its large stack. The flame spreader and the diagonal louvers in the stack, cause the flames to burn in a rapidly burning spiral, resulting in smokeless heat, and with the hottest part of the heater's stack at the base. Thus a greater sideward radiation is reported. It is a distilling-type heater with no wicks, jets or

Distilling-type heater burns 10-20 hr. on one filling of fuel oil

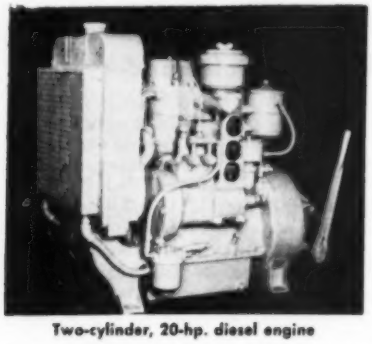
valves and burns from 10 to 20 hr. with one filling of fuel oil. Designed for use as a temporary heater inside or out of doors, it lights with a match, the burning rate being determined by the air intake in the heater bowl.

Low Speed Drives

REEVES PULLEY CO., Columbus, Ind., has announced the incorporation of a variable speed disc assembly which will provide lower speeds for the "Flexi-Speed" drive. The model may be mounted in almost any position around the driven equipment, may drive in any direction, and can provide speeds within a 6:1 ratio. Six different belt lengths offer a wide choice of shaft center distances. The low speed makes the drive especially adaptable for driving at recommended speeds to practically any gear reducer, either worm or helical, and may also be adapted to some applications without a reducer. The speed drives are available in ½-, ¾- and 1-hp. capacities.

Diesel Engine

R. H. SHEPPARD CO., Hanover, Penn., has introduced Model 17, a two-cylinder, diesel engine with 20



Two-cylinder, 20-hp. diesel engine

hp. at 2000 r.p.m. The engine will fit into a space 33 x 22 x 31 in., and may be used as the auxiliary engine on transit-mixer trucks and other equipment.

Shaft Mounted Drive

THE FALK CORP., 3001 W. Canal St., Milwaukee 8, Wis., has announced a speed reducer which mounts directly to the driven shaft and requires no floor space other than that needed for the motor and tie rod connection. It is of all-steel construction, and features helical gearing and positive lubrication. The reducer may be adapted to fit various driven shaft diameters, and is available in a choice of either a single or double reduction unit to provide a selection of output speeds from 420 to 14 r.p.m., by changing sheave sizes within allowable limits. Six sizes are available to cover the range from ½ to 30 hp.

Heavy Duty Gravel Plant

PIONEER ENGINEERING WORKS, INC., 1515 Central Ave., Minneapolis, Minn., has introduced Model 33G Triplex, a single chassis portable gravel plant which is said to eliminate the need for an additional "rock plant" to handle the larger sizes of material. It has a 18- x 30-in. primary jaw crusher, and 30- x 18-in. triple roll secondary crushing unit, which permits two almost simultaneous passes at the rock or gravel. Other basic units of the plant are: a single-deck, plate scalping screen, a 1½-deck secondary vibrating screen, hopper, mechanical feeder and necessary conveyors. All the major units are mounted on a single chassis comprised of a welded steel truck frame, rear equalizer and a single front dolly with 12 pneumatic tires. Total weight of the plant, less the power unit, is approximately 71,000 lb., and the travel length, less the towing hitch is 43 ft.; travel width, 9 ft. 8 in.; travel height, 12 ft. 6 in.

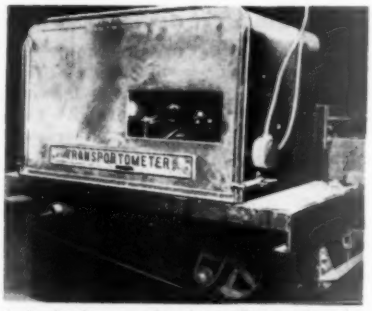
Single chassis portable gravel plant for "big boulder" applications

Pneumatic Conveyor

VACU-BLAST CO., INC., Belmont, Calif., has introduced the "Vacu-Veyor," a one-man operated portable pneumatic conveyor which conveys up to 150 ft. vertically and 200 ft. horizontally at a rate of 40,000 lb. per hr. Flexible hoses permit reaching around corners and other obstacles. The unit will convey dry, bulk powders, grains, pellets or crystals, and is powered by electricity, gasoline or diesel engines. A dust collector unit gathers dust and impurities and releases clean air, providing safety from harmful gases when handling toxic materials, and dust-free conveying. The conveyor and dust-collector are furnished as separate units and are adaptable to portable or fixed installations.

Offset Scale

SINTERING MACHINERY CORP., Transportometer Div., 320 Sinter Ave., Netcong, N. J., has designed an offset Transportometer weighing scale for use on new or existing belt conveyor installations where overhead clearance is limited. It is designed with weight integrator scale levers and suspension framework located under the conveyor. The weight integrator is mounted in a dust-tight cabinet and may be located on either side of the conveyor. The unit employs



Scale for low overhead installations handles capacity set by conveyor belt

a standard, completely mechanical, gear differential integrator which automatically and continuously records the product of the belt speed and the momentary weight passing over the scale suspension. Weighing accuracy over its entire range is said to be 99½ percent or more, regardless of belt speed or tonnage variations. Capacities to be handled are governed by the conveyor belt capacity.

Telescopic Hoist

HERCULES STEEL PRODUCTS CORP., Galion, Ohio, has introduced a front-mounted telescopic truck hoist, designed especially for heavy-duty dump

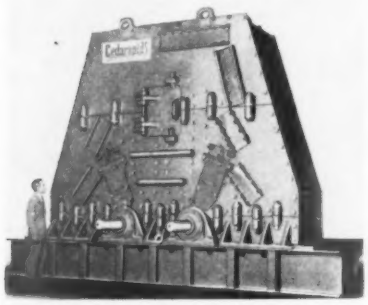
Front-mounted hoist shifts weight forward for maximum legal payloads

truck bodies from 11 to 15 ft. long. The hoist has a 20-ton capacity and shifts hoist weight forward to put more load on the front axle and meet maximum per-axle loads. It is available for single or tandem axle straight trucks, and is mounted with no part of the hoist extending below the truck frame.

Impact Breaker

IOWA MANUFACTURING CO., Cedar Rapids, Iowa, has announced Model 5360H, designed for high capacity in heavy-duty applications, an addition to its line of double-impeller impact breakers. Capacities of the model range from 500 to 800 t.p.h. of 4-in. minus product, depending upon the type and characteristics of the material processed. The impact breaker is reported to handle material up to 53 x 60 in. in size, with reduction to a minimum size of 3-in. minus in one pass, and to operate without ex-

cessive clogging. Two impellers rotate in opposite directions, striking rock, and shooting it upward through the

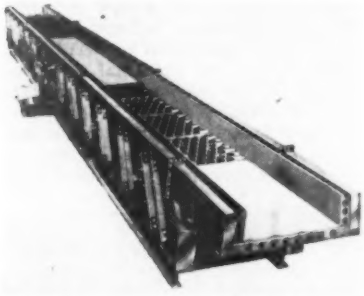


Double impeller impact breaker handles material of 53- x 60-in. size

breaking chamber above the impellers and against the round breaker bars. As the broken particles rebound downward, they are met in mid-air by incoming feed and other particles shot up by the impellers, causing a high-speed impact of stone against stone. This is said to result in approximately 50 percent less contact of stone on metal and consequent reduction of the wear on the manganese steel parts of the breaker. Horsepower requirements per ton of product are also said to be reduced, as the impellers have a flywheel effect.

Vibrating Conveyor-Screen

SYNTRON Co., Homer City, Penn., has announced a line of "Balanced, Dual Trough" vibrating conveyors and screens, for bulk materials, hot

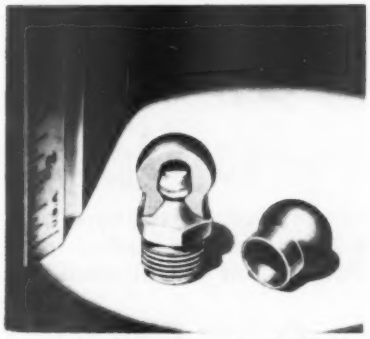


Vibrating conveyor may be fitted with screen sections

or cold, dry or damp, abrasive or corrosive-fine powders or chunk materials. The conveyors and screens are of the compulsory driven, swinging mass type in which two troughs or screens, mounted one above the other are connected by leaf springs and the whole assembly supported on guide links, follow the movement of the eccentric drive. Maximum power is required only when starting; while the unit is in operation, it has a low power requirement. The vibrating conveyors, which can also be fitted with screen sections, are available in two capacities. Model 2-B has a maximum capacity of 80 t.p.h., and is available in sections up to 65 ft. long with a trough width of 20 in., or in sections up to 30 ft. long in 40-in. trough widths. Model 6-F has a maximum capacity of 280 t.p.h., and is available in sections up to 175 ft. in the 20 in. wide trough, and up to 100 ft. in the 40 in. width. Sections can be set to any desired length, and both models are available fitted with tubular troughs. The motor drive can be furnished in voltage and phase specified.

Grease-Fitting Cover

WINNER MANUFACTURING Co., Box 945, Fort Wayne 1, Ind., has developed "Zur-Kap," a product made of oil-resistant neoprene. It is designed to keep dirt and other abrasives from entering grease fittings, and may be

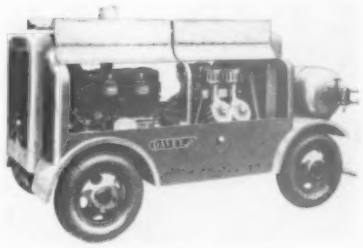


Caps protect fittings from dirt and abrasives

used on all pieces of equipment using either Zerk- or Alemite-type fittings. The caps are easy to snap on and off, and save the cleaning time usually required to clean fittings before each lubrication.

Diesel-Powered Compressor

DAVEY COMPRESSOR Co., Kent, Ohio, has announced a 600 c.f.m. diesel-powered portable compressor designated the "Davey Super Chief 600." It is available in both skid and four-wheel trailer mounting styles. Standard features include automatic com-

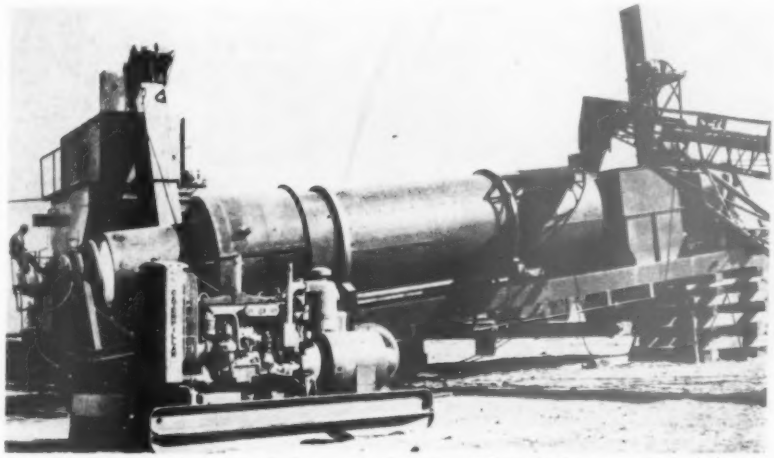


Portable 600 c.f.m. compressor

pressor-engine controls; individually-finned, separately-replaceable cylinders; full force feed lubrication; cast aluminum crankcases; multi-port valves; automatic type steering; full spring suspension; and double, built-in, full length tool boxes. The four-wheel trailer is 150 x 75 x 95 in., and weighs 9300 lb. Skid dimensions are 150 x 63 x 69 in., weighing 8700 lb.

Hot Mix Bituminous Plant

PIONEER ENGINEERING WORKS, INC., 1515 Central Ave., Minneapolis 13, Minn., has announced a portable central hot mix bituminous plant with an all-electric drive, individual motors for each functioning unit. The plant, Model 81, has a rated capacity of 60 to 80 cu. yd. per hour, utilizing a 72-x 24-in. dryer. It operates on the continuous process principle and was designed to meet demands for a "Continuflo" plant in the medium output range. Two main units comprise the plant. On one unit are the burner, combustion chamber, drier, dust-collector and fan, all mounted on a single pneumatic-tired chassis. On the other unit are the screen, three aggregate compartment bin, continuous apron feeder, mixer elevator and pugmill, also on a single pneumatic-tired chassis. The feeder, hot elevator and cold elevator can be moved on their own wheels or loaded on a truck for fast transport. The mixer unit weighs approximately 35,500 lb., and the dryer-dust collector unit, approximately 49,000 lb.



Central hot mix plant is comprised of two units, both mounted on single pneumatic-tired chasses

Left: Tom Wurts, right, Allegheny County Smoke Control Director, signaled the start-up of the new raw material mill, and the stopping of the old mill exhausting through these stacks. From left to right, C. E. Baker, president of Universal Atlas Cement Co., John Kosusko, vice-chairman of the Penn Township Board of Commissioners; E. H. Harchelroad, manager of the cement plant, Mrs. Henry Mohncke, a Penn Township housewife, and Mr. Wurts. Right: E. H. Harchelroad, manager of the plant, starting up the dryer unit in the new raw material mill section

Universal Starts Up New Raw Mill

Civic leaders, county commissioners, and smoke abatement officials among guests invited to inspect new mill at Universal, Penn. plant of Universal-Atlas Cement Co.

By BROR NORDBERG

UNIVERSAL ATLAS CEMENT CO. officially started up a new raw mill department at its Universal, Penn., plant on January 18, 1954, before a large gathering of invited guests and representatives of the press. Completion of the new raw mill department is the first phase in rebuilding of the plant, and is a major step in the continuing program of United States Steel Corp. to reduce smoke and dust from its Pittsburgh district plant operations.

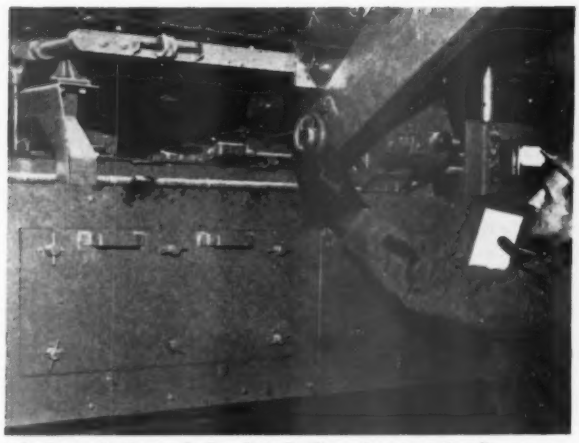
The Universal plant will have been completely rebuilt into one of the most modern cement plants in the United States by late 1955. The decision to rebuild the plant was largely motivated by the company's desire to clean up the atmosphere for the benefit of neighbors in the community and surrounding area.

This plant, like many other older ones, had no problems with respect to smoke and dust in the earlier years of its operation, but has had a community build up around it over the years that has brought atmospheric conditions into focus. It was built in 1906 at Clarksville, Penn., (now known as Universal) which was selected as the site for a plant because it was a remote area and one where slag from the parent company's Pittsburgh district blast furnaces was readily available as a raw material. Slag and limestone brought in from U. S. Steel's quarry in western Pennsylvania are the principal raw materials for cement manufacture.

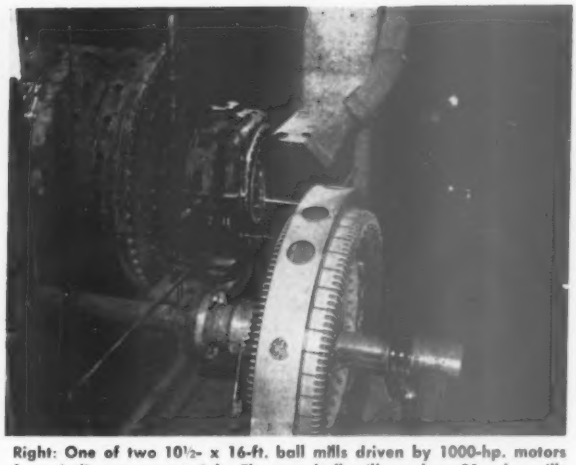
With establishment of the plant, workers' homes were built in the surrounding hills and the community grew to its present population of 2500.

Left: Storage bins supply slag, limestone, sand and blast furnace flue dust to the raw mill

Right: Three coal-fired rotary dryers. Each dryer is 8- x 80-ft. The three dryers replace 14 obsolete units



Left: Proportioning scale for slag. Similar units proportion limestone, sand and flue dust



Right: One of two 10½- x 16-ft. ball mills driven by 1000-hp. motors for grinding raw materials. The two ball mills replace 21 tube mills

The problem with respect to dust and smoke became serious as more and more people moved out into the country and the area developed into a suburban community. The company faced up to the problem and decided on a complete re-building program with emphasis on dust and smoke control so that the plant would be identified as a good neighbor.

Razing of the old plant began in October, 1952, and construction of the new raw mill started in April, 1953. When the entire program is completed in 1955, the Universal plant, which is dry process, will be as smoke and dust free as modern engineering and equipment can make it. A total of 38 stacks will have been eliminated and in excess of 90 percent of the total smoke and dust from the kilns and dryers will be collected. There will be two large smokestacks in their place and smoke will be exhausted through mechanical collectors and electrostatic precipitators.

Much of the smoke and dust had come from the old raw mill and nearly all of that from 14 stacks serving the dryers. Half of this mill was dismantled before construction of the new mill began. On January 18 the remaining half of the old mill with its seven stacks, was shut down and the new mill started, in a dramatic ceremony witnessed by Penn township civic leaders, Allegheny county commissioners and smoke control officials. Also, among the more than 100 guests were top officials of Universal Atlas Cement Co., including President Charles B. Baker, L. M. Funderburg, vice-president of operations, H. P. Reid, vice-president of engineering, and members of the engineering and production staffs; officials of United States Steel Corp.; the directors of public relations for both companies; representatives from nearby cement plants; and officers and representatives of MacDonald Engineering Co., Chicago, Ill., prime contractor for the entire project. Newspapers and the industrial press were represented.

The festivities were arranged by the Public Relations department of United States Steel Corp.'s Pittsburgh office. It was an execellent demonstration of how an industry can dramatize its voluntary contributions to the betterment of a community. Those present who had an interest in cleaning up the community will long remember the sharp contrast between the smoke and dust emanating from the old raw mill just before the shutdown, and the appearance when the new mill was started. T. C. Wurts, director of the Allegheny County Smoke Control Bureau gave the signal for the changeover.

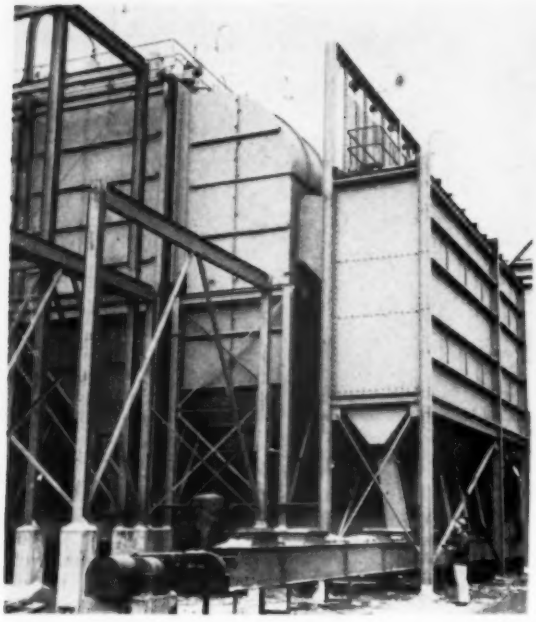
Buses and private cars were provided to take the guests from Pittsburgh to the plant where all were fitted with safety hats and made a conducted trip through the new raw mill department, following a brief welcome by plant manager E. F. Harchelroad. At the conclusion of the tour, Mr. Wurts gave the signal and Mr. Harchelroad stopped the old mill and started the new.

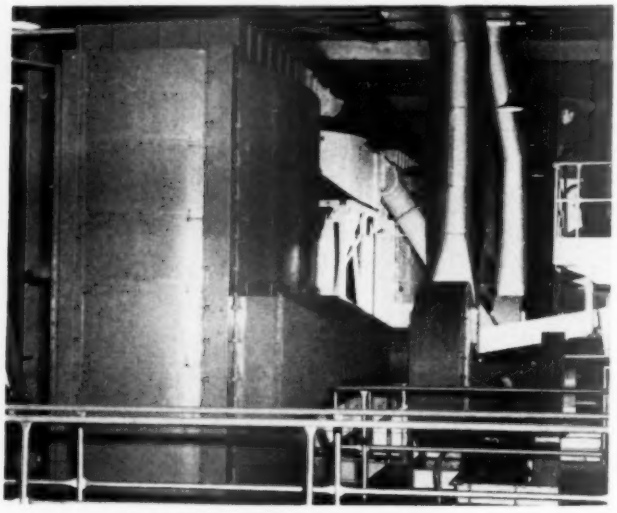
All were guests of the company for a luncheon and program at the Churchill Valley Country Club, with Plant Manager Harchelroad presiding.

President Baker's remarks about the rebuilding program gave emphasis to the fact that the decision to rebuild the plant was based largely on the desire to clean up the atmosphere and that one of the most modern cement plants in the United States will be the final result. He was frank in admitting that the Universal plant was becoming a nuisance as its rural surroundings grew into a suburb of Pittsburgh and that the company had become aware of its neighborhood responsibility to take action.

It was decided that complete rebuilding was necessary to satisfy the plant's obligation to the community. Mr. Baker pointed to the problems involved in accomplishing this objective without interrupting production.

C. B. Baker, president of Universal Atlas Cement Co., speaks at Churchill Valley Country Club, following opening of the new raw material mill. Seated, left to right, are Howard Kendall, president of Penn Township Commissioners, E. H. Harchelroad, plant manager, and J. E. Lose, assistant executive vice-president of United States Steel Corp.





Above: Mechanical dust collectors that serve the new raw mill

Left: Dryers exhaust through electrostatic precipitators. When new kilns are installed, gases will be put through dryers and, of course, exhaust through collectors

Several years of engineering studies under the direction of Vice-President Henry P. Reid were required, he said, in the design of new processing methods which would provide for the utmost in dust control.

Mr. Reid, Vice-President L. M. Funderburg, Director of Tests and Research Fred P. Diener, Plant Manager E. H. Harchelroad and their staffs were singled out for special credit for what Mr. Baker described as a team accomplishment.

Other speakers were James E. Lose, assistant executive vice-president for operations, United States Steel Corp.; Howard Kendall, chairman, Bureau Commissioners, Penn Township; Levi B. Duff, Director of Works, Allegheny County; and Thomas C. Wurts, director of the Allegheny County Smoke Control Bureau.

Plant Program

The overall program involves the razing of the old coal mill, raw mill, kilns and finish mill, and complete rebuilding of all these departments. Scheduling has been planned in order to permit uninterrupted production of cement.

Limestone, blast furnace granulated slag, sand and flue dust are the raw materials for cement manufacture in the proportions of 360 lb. of limestone, 150 lb. of slag, 10 lb. of sand and 5 lb. of dust per barrel of production. The slag contains as high as 25 percent moisture which requires the use of dryers of high capacity.

The old raw mill building measured 100 x 350 ft., and principal equipment comprised fourteen 5 ft. 5 in. x 45-ft. rotary dryers and twenty-one 5- x 22-ft. tube mills for grinding. By contrast, the new building is 100 x 175 ft. and principal equipment includes two 10½- x 16-ft. ball mills and three 8- x 80-ft. rotary dryers. Daily requirement through the mill is 1875 tons of limestone, 750 tons of granulated basic slag and 50 tons of sand.

Limestone and slag are fed separately through the dryers (Vulcan) which are fired with pulverized coal from a single B & W mill. The dryers exhaust through mechanical dust collectors followed by electrostatic precipitators. When the new kilns are completed and in operation, their exit gases will supply the heat for the dryers and thereby the kiln gases will be cleaned through these dust collectors. There are four raw material bins over the proportioning feeders, one for limestone, one for slag and one each for sand and dust. Proportioning is done by Merrick Feedoweights and the blended materials are put over a Tyler vibrating screen. Oversize is crushed through a Williams hammermill, the object being to limit the size of feed into the grinding mills to ⅜-in. top size.

Grinding mills are two Traylor units, each driven by a 1000-hp. G. E. synchronous motor. They contain a charge of 60 tons of steel balls each, ranging in size from 1¼ to 2½ in. Feed into the mills is by drag conveyors. Each mill discharges into a bucket elevator and the stream of material is fed into a 16-ft. Sturtevant mechanical air separator by an F-H Airslide. Rejects from the air separator return into the feed end of each mill directly from the reject spout. Fines drop into the hopper of a Fuller-Kinyon pump for transport into storage for blending into kiln feed material.

The building is a steel and reinforced concrete structure of sufficient size and design to provide the utmost in safety and access to equipment for maintenance. It is kept free of dust by two Day and one Norblo dust collectors.

At present there are twenty 7½- x 120-ft. rotary kilns housed in a 750- x 350-ft. building. Razing of this department started in October, 1953, and the new kilns are expected to be in operation late this year. There will be two 11- x 360-ft. kilns housed in a 60- x 270-ft. building, which will be among the largest dry process kilns to date in the United States.

Construction of the new finish mill will start late in 1954 and will be completed in late 1955. It will be located adjacent to the raw mill for efficient handling of materials from a centralized storage area. Twenty-four 5- x 22-ft. tube mills served by these overhead cranes will be replaced with four 10½- x 16-ft. mills served by a single overhead crane.

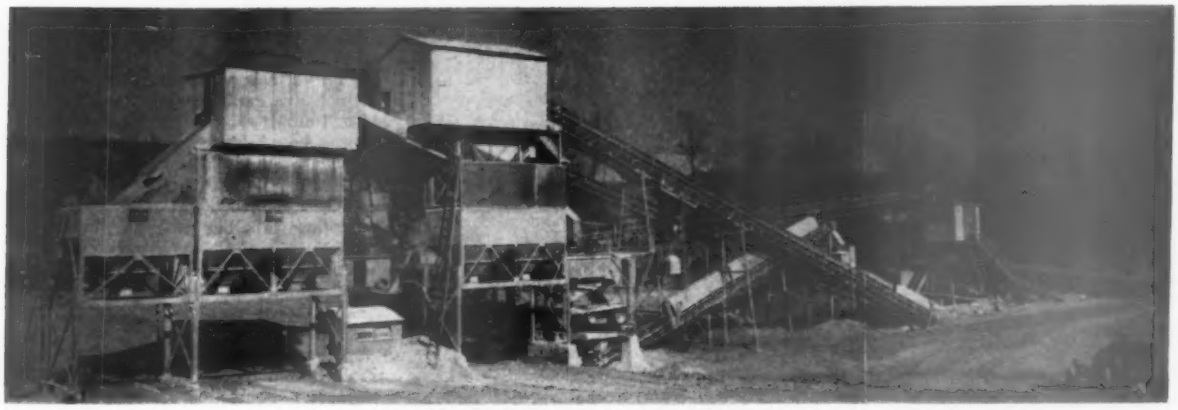
A centralized coal grinding mill is to be scrapped and the new kilns will be fired by direct-firing coal mills. A reduction in coal consumption of approximately 30 percent is anticipated.

Canadian Asbestos

CANADIAN SHIPMENTS of asbestos totaled 762,862 tons during the first ten months of 1953, compared with 781,581 tons during the same period of 1952, as reported by the Dominion Bureau of Statistics. Exports for the 1953 period amounted to 725,871 tons, compared with 743,603 tons for the corresponding 1952 period.

Perlite Processing Plant

AIRLITE PROCESSING CORP., has announced the establishment of a new perlite-processing plant at Vero Beach, Fla. David Funk is superintendent at the new plant and Wallace Carpenter is sales manager.



Overall view of new screening and crushing plant

IMPACT CRUSHERS
For Both Primary and Secondary Crushing

Bradford Hills Quarry, Inc., Norristown, Penn., uses impactor for primary crushing and hammermill for secondary. Conveyors handle all intraplant transportation

By WALTER B. LENHART

ONE OF THE NEWER CRUSHED STONE OPERATIONS in eastern Pennsylvania is that of the Bradford Hills Quarry, Inc., at Norristown. This company's main plant is at Downingtown, Penn., in the same general area. The principal owners of the company are Harry Erb, Mel, and Ralph Binkley. The company is affiliated with Binkley & Ober, Binkley Bros., and the Milton Grove Sand Co., Inc., with head offices at East Petersburg, a community a few miles west of Lancaster, Penn.

The Norristown operation is entirely new, and replaces an older plant that was operated at the same quarry site by the Veterans Quarry. The plant is built on a wide bench and about half way between the quarry working floor and its rim. All shipments are by truck with the scale house near the highway serving the area. The new plant is a Cedarapids packaged plant which was designed and supplied through L. B. Smith, Inc., Camp Hill, Penn. The plant is a permanent installation, operates dry, and uses belt conveyors throughout for inter-plant transportation, and for the most part is not covered. However, there are small buildings over two of the three vibrating screens used in the plant.

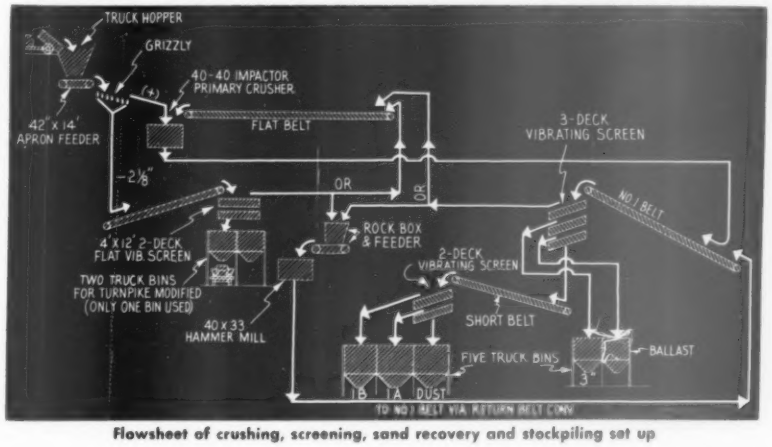
Loading in the quarry is with a 1¾-cu. yd. Lima shovel equipped with a Mesabi type, Essco bucket. The shovel is powered with a Cummins diesel and loads to a fleet of five Koehring Dumptors. Primary drilling is done by contractors, however, a Joy Wagon drill and a rubber-mounted Joy portable compressor is available. A General crane handles the drop ball work with a second shovel of this type available for additional quarry loading. The haul from the quarry loading floor to the primary crusher is about 600 ft. and over a relatively steep grade. A Hough Payloader is available for reclaiming from ground stored material.

Crushing and Screening

The primary crusher is a 40-40 CR impactor driven by electric motors. A 40-33 hammermill is used for secondary reduction. However, the plant can operate without the hammermill in which event plus sizes from the screens are returned to the primary crusher by a nearly flat running belt conveyor. All conveyors use greased-for-life idlers so no walkways are provided alongside the conveyor assemblies.

In Pennsylvania there has been a wide acceptance of impactors for primary and secondary crushing in the state's many limestone quarries. Companies affiliated with Bradford Hills Quarry, Inc., have five impactors in the plants, including one 50-50, two 40-40, and two 30-30 units.

One of the novel features of the operation is the use of a F-66, heavy-duty Syntron Vibraflow grizzly between the 42-in. x 14-ft. apron feeder under the truck hopper, and, the 40-40 impactor. This Vibraflow grizzly removes a minus 2⅛-in. material which is moved by belt conveyor to a flat 4- x 12-ft. double-deck screen



Flowsheet of crushing, screening, sand recovery and stockpiling set up

Large impact type primary crusher may be seen in foreground. Hammer mill for secondary crushing is below conveyor, to the left

mounted over two truck bins. This material, after taking out any plus size desired, can go for Pennsylvania 2A modified specification. At the time of inspection, the material was being trucked as Turnpike Modified which was said to be slightly coarser than Pennsylvania 2A. The latter is a minus 1-in. material with allowable percentages of finer inclusions and can be used for stabilized road base material and other similar uses.

Plus material from the vibrating grizzly goes to the 40-40 impactor, the product being screened over a 3-deck and a 2-deck screen with a short belt conveyor between. All screens are 4- x 12-ft. Cedarapids units. The flowsheet gives additional details, however, it will be noted that the plus rock from the screen producing Turnpike Modified, or from the 3-deck screen can be chuted to a F-45, Syntron Vibraflow feeder that serves the 40-33 hammermill, insuring an even flow of rock to that unit. The Vibraflow feeder is mounted under a steel rock-box ahead of the hammermill. In the event the hammermill is down, the rock can pass to the flat running belt conveyor and be returned to the primary impactor. Wear on the impactor and hammermill is nominal. The new plant went into operation in July, 1953.

Ray Yeager is plant superintendent. Fred Coleman is sales manager with headquarters at the Downingtown operation. J. Pfhall, formerly with New Holland, is purchasing agent for the group of companies with offices at East Petersburg. Ed Rothrock is scale-man at Norristown. Bradford Hills Quarry, Inc., is the third company to operate from this quarry and Mr. Rothrock has worked there practically continuously for all the three companies.

Shovel with 1¼-cu. yd. bucket loading rear-dump haulage unit

Perlite Production and Outlook

PRODUCTION OF EXPANDED PERLITE in the United States in 1953 amounted to approximately 178,000 short tons, a 15 percent increase over 1952 production, according to preliminary estimates recently released by the Perlite Institute. Cash value of the expanded material was estimated at $9,000,000. Total sales of crude perlite are expected to total about 189,000 short tons, valued at about $1,150,000. Due to the fact that perlite mining is limited to seven Rocky Mountain states, the delivered prices of both the crude and expanded material vary greatly in various sections of the country, depending upon the freight charges involved.

The Perlite Institute reports that the industry has continued to experiment and gather data on new uses for expanded perlite. Increases were noted in the sale of specially graded expanded perlite for use in foundries; for various types of loose fill insulation; and as a filter aid in various industries. However, approximately 90 percent of the material still goes into lightweight, fire-retardant plaster and insulating concrete.

Three new developments in 1953, which are expected to affect the perlite industry for some time to come, were listed by the institute as follows:

1. The Perlite Institute, in June, 1953, launched a nationwide certification and labeling program for perlite plaster aggregate. (See ROCK PRODUCTS, July, 1953, issue, p. 48.)

2. Perlite has now been recognized as an ideal plaster aggregate by all the major gypsum companies, which, by the end of 1953, were distributing mill-mixed perlite and gypsum for plaster. Some of the gypsum producers have installed their own perlite-processing plants, while others continue to purchase expanded perlite from independent perlite manufacturers.

3. A sizeable new market for perlite miners also seems to be developing in Canada. At least four expanding plants are already in operation there, with several others under construction. While Canada has perlite deposits in its western provinces, existing freight rates reportedly make it more economical for plants in eastern Canada to purchase crude perlite from U. S. miners.

The outlook for the perlite industry in 1954, according to the institute, appears to be good. While the total volume of building construction is expected to decrease slightly, the perlite industry as a whole anticipates another substantial increase in perlite sales. Aggressive competition between separately bagged perlite aggregate and the newer mill-mixed perlite-gypsum should enable perlite to capture an even greater share of the plaster aggregate market. Also, independent perlite producers are expected to devote increasing attention to the sale of perlite aggregate for insulating concrete. A large potential market is said to exist for both poured-in-place and precast perlite-portland cement concrete for roof deck insulation and as a lightweight floor fill in multiple-story buildings.

Acquires Limestone Deposit

THE NORTHWESTERN PORTLAND CEMENT CO. of Seattle, Wash., recently acquired a large limestone deposit at an undisclosed location. The company reported that operations at the quarry "should be more economical because weather conditions will permit us to produce limerock for a longer period during the year."

Stone Company Sold

LAMAR STONE CO., Princeville, Ill., subsidiary of Pontiac Stone Co., has been sold to Mr. and Mrs. E. D. Werner. Mr. Werner has operated this quarry and plant since its establishment in 1938. Agricultural limestone, and highway and black-top materials are produced.

OPINION Vs MEASUREMENT

In the Evaluation of Vibration Effects from Blasting

By HAROLD H. WHITE*

IT IS COMMON KNOWLEDGE among those engaged in the courts, both judges and lawyers, that half a dozen witnesses to an event will give conflicting testimony on the witness stand. There is probably no field in which differences of opinion are so pronounced as in cases involving explosives reactions or explosives effects.

As an example, last July 4th, a youth in Amarillo, Texas, threw a small firecracker in front of a motorcycle patrolman. The police officer arrested the youth and in his court testimony he stated that the blast of the firecracker "nearly threw him from his motorcycle." This statement from an officer accustomed by his experience and training to present the facts under oath on the witness stand is remarkably similar to the statements heard in blasting vibration cases, that the effect "threw people out of bed" etc.

It is not difficult to explain the cause of such wild exaggerations, for an explosive noise is connected in the minds of most people with violent destruction. There is little doubt that such exaggerations on the part of reputable witnesses have contributed to gross miscarriage of justice in the award by the courts of sums in payment of damage due to the effects so vividly described.

Within recent years, the presentation of a case in court involving damage resultant from explosions was difficult to defend for the means to evaluate the effect, in terms understandable to a jury had not then been developed.

At the present time this condition has been improved with the introduction of portable seismographs which not only measure the effect, but record it, thus providing evidence of its actual magnitude.

The comparison afforded by presentation of recordings of blast effect with recordings of normal vibration which is always present in an occupied structure places blast vibration in its proper perspective and in such a manner that even the most unscientifically inclined juror can form a proper opinion regarding its magnitude.

The specialized study of vibration effects is a product of our industrial age and its effects upon people is but a single phase of the study. Tests of the effect upon people have disclosed that the human body is sensitive to unusual motion but at the same time, adjustable to regular motion to the point that it is not noticed. If noise accompanies the motion the effects become subject to exaggeration which has been noted on tests to reach 1000 percent.

Industrially, the magnitude of vibration is studied for its effect on delicate instruments which become inoperative under conditions of disturbance. Many of our vital defense projects demand stability, among these are certain phases of the nuclear energy process and the machining of jet motor parts.

In both of the examples cited, the plant area is "monitored" for existing vibration levels before the plant site can be established and, once in operation, the vibration effect from traffic and adjoining industries is a matter of concern.

The degree of significant vibration from the standpoint of successful operation of the plants described is minute in comparison with motion sufficient to cause actual damage to a structure, but the same instruments are used for measurement and analysis in each case.

Measurement of Safe Loading Limits

Many of the operations throughout the country using explosives are taking advantage of the means for measurement of effect to establish safe loading limits. The recording of blast effects in the plant area afford the "yardstick" for measurement of safety, and most of them confine their blasting operations to a safety factor of five or more, which means that five times the safe charge established by test of effect would be required to cause the slightest kind of damage.

This safety factor is most effective when based upon the effect on the weakest of the construction materials which is accepted as plaster.

In the evaluation of blasting vibration effects, we have found that the minute waves transmitted by a blast explosion are of such long wave length that the ordinary structure in their path rides them in similar manner to that of a crate on the ocean.

The old idea of shaking like that of a terrier with a rat is completely dispelled by examination of the recordings. It is still true that motion transmitted through the ground, if of sufficient magnitude, can do damage, but the magnitude of the waves is the most important factor and the fact that they can be felt means nothing.

Motion of a dimension of 0.0005 in. is recordable on the instruments used for the measurement of blasting effect. This is sufficient to shake precariously balanced objects in a house and it may be felt by the occupants if they are attentive.

Yet such displacement can be referred for a practical idea of its magnitude to half the thickness of the finest tissue.

The sound effect from a nearby blast is often misleading to those who attempt to judge vibration intensity from this associated effect. With the seismograph stationed within a structure, all motion whether it is transmitted through the ground or through the air is recorded.

Sound, of course, varies in accordance with wind direction and atmospheric differences, but beyond a distance of 400 ft. from a regular commercial blast the recorded effects from similar blasts, regardless of these differences, are remarkably uniform, so much so that the air-borne effect can be termed literally insignificant.

*Consulting engineer, Industrial Seismology, Joplin, Mo.

Arizona Asbestos

A RECENT ISSUE of *Asbestos* contained a report by Jack L. Neal, secretary, Arizona Asbestos Producers Association, on "Report on Arizona Asbestos Field," which discusses the growing asbestos mining industry in Gila County, principally chrysotile asbestos. A gradual increase in activity started in the late 1920's and reportedly has been continuing upward ever since.

At present time there are seven small mills operating in the district, but none are said to be capable of very large tonnages except perhaps the Globe Asbestos Mill, with major improvements. This plant is owned and operated by D. W. Jaquays Corp. which also operates the Regal mine. The Phillips mine and plant, operated by Guy Phillips of Gila County, has long been a leading producer of high quality crude and filter fiber. Mr. Phillips also operated the Ladder Mine in the Salt River District for several years.

Canadian Gypsum

SHIPMENTS of crude gypsum in 1952 by Canadian producers totaled 3,590,783 tons, valued at $6,538,074. This was a decrease in quantity but an increase in value from the 1951 shipments which amounted to 3,802,692 tons, valued at $5,880,853. Nova Scotia accounted for a major portion of the 1952 production, with shipments totaling 2,969,312 tons. Shipments from Ontario totaled 278,992 tons; Manitoba, 130,934 tons; New Brunswick, 110,183 tons; and British Columbia, 92,702 tons.

General view of plant. To the left, are the two sand recovery units, and in the background are the stockpiling conveyors

Ramapo Sand & Gravel Co., built a new plant near Suffern, N.Y. to supply aggregates for heavy industry in the Hudson River valley near the New York Thruway. Plant has large stockpiling and bin facilities for finished products

By WALTER B. LENHART

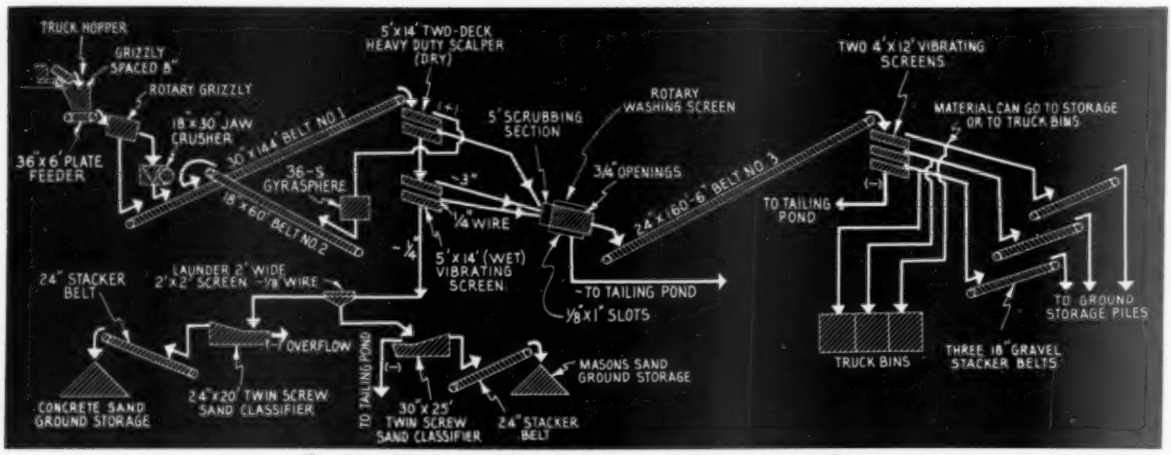
PRODUCE MANY SIZES
To Meet Heavy Construction Requirements

DURING THE EARLY SUMMER MONTHS of 1953 the Ramapo Sand & Gravel Co., Ramapo, N.Y., placed a new sand and gravel plant in operation. The plant is a few miles north of Suffern, N.Y., and will serve the heavy construction programs now going ahead on the west banks of the lower Hudson river valley. Heavy industries of many kinds are moving into the area and construction of the southern leg of New York's Thruway is getting under way not far from the new operation. All material from the plant is shipped by truck as there are no rail connections.

The source of gravel is from remnant glacial materials along the east flank of the Ramapo river that cuts southerly through the area. The immediate vicnity is heavily covered with small trees and brush. Overburden as such is not extensive so stripping consists mainly of removing surface vegetation, roots, etc. Like most glacial drift the deposit contains some oversize gravel that is pushed aside in the pit or wasted at the grizzly serving the primary crusher set-up.

The plant is largely Telsmith equipment. Harry Buckenheu, New York City representative of the Smith Engineering Works, arranged for all of the equipment going into the new plant. Barber-Greene supplied all the conveyors which have Hamilton belts. The plant, designed under the direction of E. E. Kraig, chief engineer for Smith Engineering Works, was built by the company.

Loading in the pit is with a No. 65. 1½-cu. yd. Bay City shovel powered with a Cummins diesel. A D-7 Caterpillar and dozer helps keep the pit material pushed up to the shovel, and is used for stripping and other miscellaneous tasks. The shovel loads to a fleet of four C-90 Autocar trucks that hold 10 cu. yd., water level. Sides of the truck are built up considerably higher than necessary with the intent of eliminating spillage should the units be used on the highways. The haul to the truck hopper varies from a few hundred feet to a half mile as the deposit parallels the stream nearby. The grades are flat



Flowsheet of crushing, washing, sand recovery and screening operations

Left: Gyratory type crusher may be seen in the background with the sand screw for the preparation of masons sand in the foreground. Right: A 60 in. by 18-ft. rotary washing screen. Fines are wasted

except going up the ramp serving the primary crusher.

Crushing and Screening Plant

Under the concrete truck hopper at the primary crusher is a 36-in. x 6-ft. Telsmith plate feeder serving a No. 540 rotary grizzly. Plus 3-in. gravel falls to an 18- x 32-in. Telsmith jaw crusher. Throughs from the rotary grizzly and the jaw crusher fall to Belt No. 1 (30 in. wide x 144 ft. long) serving the preliminary screening tower.

Here the sand fractions are separated from the gravel by two screens in series. The first is a 5- x 14-ft. two-deck, heavy-duty scalper, operated dry, followed by a 5- x 14-ft. Vibro-King two-deck screen, operated wet. All gravel fractions recombine and go to a 60-in. x 18-ft. Ajax rotary washing screen where they are given a thorough scrubbing and a washing. The Ajax scrubber has a 5-ft. scrubbing section with the remaining inner barrel having ¾-in. openings. A 10-ft. long sand jacket with ⅛- x 1-in. slots is the other jacket. Fresh water is added at the throat of the scrubber with sprays inside the barrel and also between the inner barrel and sand jacket. The sand from the outer jacket is sent to the tailing pond. After scrubbing the gravels are recombined and fall to Belt No. 3 (24-in. wide by 150-ft., 6-in. long) that delivers to the final screening tower where two 4- x 12-ft. Vibro-King screens receive a split feed.

Three sizes of gravel are made, and these can fall to three S-45 Butler truck loading bins, or the material can go to individual stacker belts for ground storage. The Barber-Greene stacker belts for the gravel are 18 in. wide; those for the two sand sizes are 24 in.

Returning to the preliminary screening tower, the plus fraction from the scalper falls to a 36-S Telsmith Gyrasphere reduction crusher and the throughs are returned to No. 1 belt by an 18-in. Barber-Greene belt conveyor, 60-ft. centers. Sand (minus ¼-in.) from the lower deck of the Vibro-King screen passes to a steeply inclined launder that is about 2 ft. wide. This launder delivers the bulk of the pulp to a 24-in. x 20-ft. twin Telsmith sand dewatering unit which prepares the concrete sand. Near the lower end of the 2 ft. wide launder, a piece of ⅛-in. wire screen has been put in place that is essentially a part of the bottom of the launder. It is roughly 2- x 2-ft. in area. Hence some of the minus ¼-in. pulp from the Vibro-King screen passes through this screen. This material, plus the overflow from the first battery of twin screws, flows to a 30-in. x 25-ft. twin Telsmith sand classifier and the material recovered here is the masons sand. Both sands are stacked by individual 24-in. stacker belts.

Plate feeder and rotary grizzly precede the 18- x 32-in. primary jaw crusher

The overflow from the second twin screw flows to one of three tailing ponds. Two of these ponds cover two acres and the third, one acre. The ponds have been diked up to allow for 10-ft. depth of liquid in the ponds.

The plant is practically all of steel construction and operates without cover. Two Worthington pumps deliver water from the Ramapo river for all plant operations. The units have a capacity of 3500 g.p.m. Reclaiming from ground stored material is by two Haiss loaders.

The offices of the company are at the plant. Franklin Reinauer II is president of the Ramapo Sand & Gravel Co., Matthew Piermatti is general manager, and Harry De Witt is plant superintendent.

■

HALLWOOD SAND & GRAVEL CO., Marysville, Calif., has expanded plant operations by the addition of a large portable rock crusher.

Final screening tower has two 4- x 12-ft., three-deck vibrating screens over three bins

TEXAS INDUSTRIES Blankets the Fields of

Aerial view of Dallas Lightweight Aggregate Co., plant in the foreground, with Texcrete Co., plant in the background. Both are subsidiaries of Texas Industries, Inc. Haydite is produced from shale at the three-kiln plant and transported by 700-ft. belt conveyor to the concrete products plant

THERE WERE NO LIGHTWEIGHT AGGREGATE plants in Texas, Oklahoma or Louisiana at the end of World War II. The fact that this situation deprived a large segment of the construction industry of the advantages of lightweight concrete impressed two groups of Texas businessmen at about the same time.

In 1946, James H. Snowden and George A. Meihaus, who had served together in the United States Navy throughout the war, organized the Texcrete Co. and built lightweight concrete masonry plants first in Fort Worth and then in Dallas. The same year Orville W. Erringer, an investment banker of Dallas, with two associates, organized the Texas Lightweight Aggregate Co. and built a plant at Eastland, about 50 miles west of Fort Worth. These two companies were destined to be the nucleus of what is now Texas Industries, Inc., which was organized in 1951.

At the end of 1953 four plants in Texas, one in Oklahoma and one in Louisiana were manufacturing lightweight aggregate made from expanded clay or shale under the trade name "Haydite." These six plants are part of the extensive operations of Texas Industries, Inc., which by contract with American Aggregate Company, has exclusive right to the use of the copyrighted name "Haydite" in its territory. With 15 rotary kilns, the six plants have a combined annual productive capacity of more than 500,000 cu. yd. of lightweight aggregates. Company officials say that Texas Industries, Inc. is now the largest producer of expanded clay and shale lightweight aggregate in the United States.

The lightweight aggregate plant at Eastland, Texas, has four rotary kilns and processes shale as does the Dallas plant with three kilns. Other lightweight aggregate plants of Texas Industries all process clay. The plants at Stafford and Rosenberg, Texas each have two rotary kilns as have the plants at Alexandria, La., and Choctaw, Okla.

Now 28 Different Plants

But the far-flung activities of Texas Industries, Inc., are by no means restricted to lightweight aggregate plants. In 1953 the company was also operating ten plants making concrete masonry units, concrete joists and various structural shapes or concrete pipe. Seven plants of the company were making ready-mixed concrete. There were also four sand and gravel plants and one crushed stone plant, a total of 28 different manufacturing units.

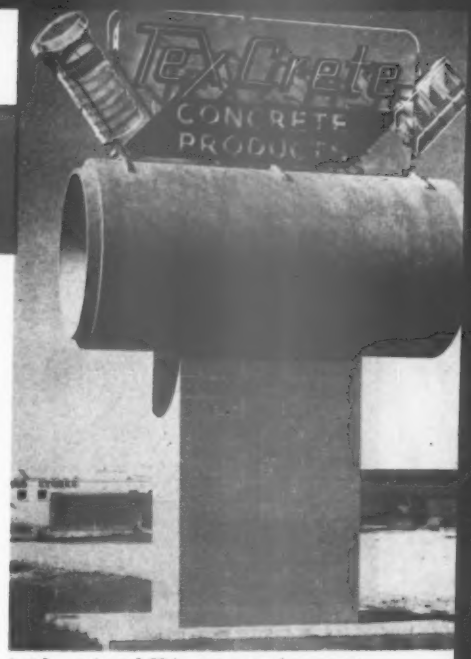
How all these scattered plants were put together to form a corporation with net sales of nearly six million dollars in the third year of its existence is an exciting story as typically Texan as cattle ranches or oil fields.

The scope and size of the Texas Industries set up may not seem impres-

Concrete and Aggregates

One of the most rapidly growing enterprises in the Southwest is Texas Industries, Inc., Dallas, Texas. It is the largest producer of lightweight aggregate manufactured from shale or clay, and it has recently expanded operations to include sand and gravel, crushed stone, ready-mixed concrete, concrete block and concrete pipe

By HUBERT C. PERSONS*



A 6-ft. section of 72-in. concrete pipe mounted on a concrete masonry pedestal makes a dramatic and attention-getting sign at the entrance to the Corpus Christi plant. The name Texcrete stands out in neon lights at night

sive when compared with heavy goods industries in the populous northern states. But the success of the organization is impressive considering that Texas Industries operates in a field where the shipping range for products is limited; in a state where the population per square mile is less than half the national average and in an industry where manufacturing plants have traditionally been almost entirely local in scope. Indeed many Texans in the building business hail the advent of Texas Industries as one of the best things that has happened to Texas since Santa Anna took the count at San Jacinto.

Philosophy Behind Company

Ralph B. Rogers, president of Texas Industries, Inc., believes that the importance of proper management and adequate capital to the success of a business are too often overlooked. "Fundamentally a small business is no different from a large business," Mr. Rogers points out. "But they often differ in the degree of efficiency with which they supply the demand for their products or services. Independent manufacturing units in all lines are faced with the problem of getting efficient management. The average small or medium size business cannot afford to employ the specialists who are essential to success in a manufacturing business today. Consider for example, the single matter of tax problems. It is well known that a thorough understanding of all phases of taxation may often result in substantial savings to a corporation. Yet your small business seldom has or can afford a tax expert among its own personnel."

Efficient management and adequate financing, Mr. Rogers believes, benefit the general public as consumers of manufactured products, benefit employes through increased earnings per unit of work and by helping to stabilize employment. Investors, he says, are naturally benefited by greater returns per dollar invested.

The management of Texas Industries includes men who are thoroughly experienced specialists in the various fields of operation. "We have set up a management," Mr. Rogers says, "qualified to undertake the study of any special problem relating to the field in which we operate, and come up with an intelligent answer. The efficiency of this management is reflected in the fact that in the concrete block business, for example, quality is being obtained which was unknown or thought to be unattainable three or four years ago. This is due to efficient control of quality from the making of the aggregate to the manufacture and curing of the block."

Mr. Rogers believes in striving to attain specific objectives. At the beginning of the year he told his executives:

"Our ambition in 1953 is to make each and every plant the leader in its individual field. We want increased sales volume at a fair price to both the customer and the company. We want to be the low-cost producer of high-quality products. No one must be able to produce at a lower cost, and no one must be able to surpass our quality."

When Mr. Rogers came to Dallas in 1950, he was not a stranger to the concrete industry. Although some of his business life had been in the management of machinery companies, he was then and still is a director of Southern Materials Co. of Richmond and Norfolk, Va. This company is one of a group of affiliated companies including the Southern Block & Pipe Co. of Norfolk, Concrete Products Co. of Richmond, and Southern Lightweight Aggregates Co. of Richmond.

In August, 1950, Mr. Rogers became a director and later chairman of the board of the Texas Lightweight

Fort Worth Sand & Gravel Co., Inc., subsidiary of Texas Industries, Inc., supplies ready-mixed concrete from six plants in the Fort Worth area as well as sand and gravel and crushed stone. A fleet of 65 vehicles, including 46 mixer trucks and three mixermobiles, is operated

Ralph B. Rogers, president of Texas Industries, Inc.

Aggregate Co. Although lightweight aggregates and indeed concrete masonry in general were not widely used in Texas, Mr. Rogers felt confident that these materials would fill a need and gain rapid acceptance.

Consequently, Mr. Rogers and several associates organized Texas Industries, Inc. in April, 1951 with the Texas Lightweight Aggregate Co. and the Texcrete Co. as a nucleus. The next companies coming into the Texas Industries orbit were the Foamrock Corp. with an aggregate plant at Stafford and Herculite Corp. at Houston operating an aggregate plant at Rosenberg.

Buy Additional Companies

In rapid order, the new corporation then acquired in Texas the Thomas Concrete Pipe Co. at Corpus Christi, Builders Supply, Inc. at Pharr, the Hobbs Building Block Co. of Austin, and the Universal Concrete Products Co. at San Antonio. In Louisiana, the company also purchased Louisiana Lightweight Aggregates, Inc. with plant at Alexandria; Lalite Blox, Inc. with plant at Shreveport, and Acme Cement Products Co., Inc. with plant at Natchitoches.

Other companies purchased by Texas Industries, Inc. included the Central Culvert Corp. with plants in Alexandria, Monroe and Shreveport, La., making concrete block and pipe and operating a ready-mixed concrete business. The company also organized Dallas Lightweight Aggregate Co., Dallas, Texas, and the Oklahoma Lightweight Co. at Choctaw, near Oklahoma City, Okla., both with modern new plants.

Sand and Gravel Plants

In April, 1953, Texas Industries purchased the Fort Worth Sand & Gravel Co. and its associated companies. These were: Tarrant Gravel Co., producer of sand and gravel in Tarrant County of which Fort Worth is the county seat; Hurst Gravel Co., producer of sand and gravel; Bridgeport Stone Co., producer of crushed stone. (see ROCK PRODUCTS, July, 1953.); and B. & R. Transportation Co., operating a fleet of 45 ready-mixed concrete trucks.

Texas Dry Concrete Co., producing ready-mixed dry concrete in its plant at Hurst, near Fort Worth, pack and distribute the product under the registered trade name of Sakrete through a license from Sakrete, Inc. for distribution in Texas (east of 102nd Meridian), Oklahoma, Arkansas and Louisiana.

Distribution of Sales

All Texas Industries masonry products are now marketed under the name "Texcrete" including Haydite block. Before acquisition of the Fort Worth Sand & Gravel Co. and its affiliates, 18 percent of the company's sales was lightweight aggregate and 72 percent was lightweight concrete masonry units. The remaining 10 percent was made up of concrete pipe, joists, lintels and other precast structural units. The sale of sand and gravel and ready-mixed concrete was accounting for 85 percent of the sales volume of the Fort Worth group of companies. Sakrete and crushed stone made up the remaining 15 percent. This included agricultural limestone, and crushed limestone used as a fluxing agent in steel mills and as a filter medium in sewage disposal plants.

Lightweight concrete masonry units made in Texas Industries plants are generally priced 10 to 15 percent higher than heavy aggregate units. Cost of the basic 8- x 8- x 16-in. lightweight unit is usually two to three cents higher than heavy units of the same size. Cost in the wall, however, is said to be about the same for either the light or heavy units because of the additional cost of laying the heavier units.

Cedric Willson, vice-president in charge of engineering

Alexander R. McVoy, vice-president in charge of all lightweight aggregate operations

Lightweight aggregates made in Texas Industries plants sell in the larger cities at $2 to $3 more per cubic yard than heavy aggregates. Ready-mixed concrete plants also charge from $2 to $4 more per cubic yard for concrete made with lightweight aggregates than they do for heavy concrete with the same cement factor. In spite of the price differential, executives of Texas Industries say there is a growing acceptance for lightweight concrete and lightweight aggregates. They point out that Texas Industries plants are spread out geographically so that nearly all of Texas, Louisiana, Arkansas and Oklahoma can be served efficiently.

Fortunate in Personnel

Texas Industries has been singularly fortunate in that the previous owners and managers of plants which have been acquired have remained to assume key positions in the new organization. Three outstanding examples of this continuity of operating management are Arthur J. Clark, vice-president in charge of the concrete products division, including block and pipe; Alexander R. McVoy, vice-president in charge of lightweight aggregate division, and Cedric Willson, vice-president in charge of engineering.

Mr. Clark was the founder and president of Builders Supply, Inc. at Pharr, Texas, before that company was taken over by Texas Industries. He was one of the organizers of the Texas Concrete Masonry Association and a director of that body. He has been a vice-president of Texas Industries since April, 1952.

Mr. McVoy was one of the founders of the Foamrock Corp. at Stafford, and was its president when it was absorbed by Texas Industries. He became vice-president of Texas Industries in April, 1952.

Mr. Willson, who had been vice-

president and general manager of the Herculite Corp. was vice-president in charge of engineering of the Texas Lightweight Aggregate Co. when it became Texas Industries. He had previously been vice-president of the Halliburton Portland Cement Co. and a plant superintendent of Trinity Portland Cement Co. He was named as vice-president in charge of engineering of Texas Industries in 1952.

Charles E. Marshall, executive vice-president of the Fort Worth Sand & Gravel Subsidiary, became an executive of Texas Industries in 1951. From 1936 to 1948 he had been with the United States Rubber Co. with the exception of four years in the United States Navy during World War II. He was made chief of the Germany-Austria-Trieste Branch of the E.C.A. in Washington in 1948, and from 1949 to 1951 he served as Deputy Chief of the E.C.A. Mission in Western Germany and as Deputy Director of the Office of Economic Affairs, Allied High Commission in Frankfort, Germany.

Orville W. Erringer, vice-president for finance, was one of the founders of the Texas Lightweight Aggregate Co. Since 1931 he has been engaged in the development and management of various investment and industrial enterprises.

Thomas E. Popplewell, president of the Fort Worth Sand & Gravel Co. subsidiary, is widely known throughout the concrete industry. He has been actively engaged in various phases of concrete manufacture for more than 30 years. According to Mr. Popplewell, the Fort Worth Sand & Gravel Co., started in 1922, operates the second oldest ready-mixed concrete business in the United States, the oldest being the Warner Company in Philadelphia. Mr. Popplewell is a past president of the National Sand and Gravel Association.

George A. Meihaus, vice-president of the Fort Worth Sand & Gravel Co. subsidiary, was one of the founders of the Texcrete Co. He has been active in the work of the Texas Concrete Masonry Association, and for a year was president of that organization. He was especially active in the association's work which resulted in obtaining more favorable fire insurance rates for concrete masonry buildings. Mr. Meihaus is now in charge of sales and distribution of the products of Fort Worth Sand & Gravel Company.

Russell E. Kibbe, Jr., treasurer of Texas Industries, Inc., had been chief accountant of the Indian Motorcycle Co. of Springfield, Mass., before being employed by the Texas Lightweight Aggregate Co. in 1950.

Harold B. Pressley, Jr., secretary of Texas Industries is a member of the Dallas law firm of Locke, Locke & Purnell.

John R. Skiles, assistant treasurer and assistant secretary of Texas Industries was for many years an accountant with the firm of Ernst & Ernst.

At a recent sales meeting of Texas Industries, Inc., may be seen, left to right: Charles M. Leake, general manager, Texcrete Co., San Antonio; Arthur J. Clark, vice-president, Texas Industries, Inc., parent company; and Everett E. Knott, general manager, Texcrete Co., Dallas

President Rogers believes that the practical experience, technical skill and enthusiasm of the group of officers and key executives of Texas Industries are the company's most priceless assets. He reiterates his belief that the men in this group, backed by the 885 employes in the various plants, are capable of finding a practical solution to any problem which may be encountered. He points out that in the comparatively short time that the corporation has been operating, definite advances have been made in the quality of production and that a number of new products are past the development stage and ready for intensive promotion.

The importance with which the company regards laboratory research and product development was made plain by President Rogers in a letter accompanying the company's annual report. "The company's research program has been carried on without interruption and is steadily expanding," he said. He characterized the company's new laboratory in Dallas as "the finest of its type in the South-

General offices of Texas Industries, Inc., in Dallas, offers an interesting display of some of the company's products. Trellis at the left is made of Haydite concrete lintels, planter box and far wall is of Texcrete Roman stone, and table top and floor is of Haydite concrete terrazzo

T. E. Popplewell, president of Fort Worth Sand & Gravel Co.

west." President Rogers is optimistic about the future. "The development of new products together with the refinement of present products should amply repay the considerable investment in research and engineering facilities," he wrote.

Market Studies Made

Although the mergers of the companies now a part of Texas Industries appear to have been accomplished quite rapidly, actually careful market surveys and an analysis of the potentialities of each company preceded the purchase.

Before purchasing each plant, the company under consideration was very carefully analyzed from the standpoint of profits shown and through close observation of equipment and all physical assets. Each purchase was carefully studied with relation to that company's local market, economic conditions and trends in the surrounding area and also with regard to how the purchase of that particular company would fit into the overall pattern of the Texas Industries organization.

It was realized that because most of the companies being taken over by Texas Industries had been established parts of their communities for some years, with new owners problems of community relations and employe relations might arise.

"It was soon discovered," Mr. Rogers said, "that Texas Industries would operate only on a fair, equitable and just basis with its customers, and its employes. It was likewise evident to the key employes and subsequently to the men in the ranks that although Texas Industries was a hard-working company its firm policy was to deal with absolute fairness to everybody concerned.

"The personnel of the newly acquired companies very shortly began to feel secure in their jobs, happy with the new owners and even enthusiastic about the policies and methods of operation of Texas Industries. Inevitably such a feeling soon permeates through the entire plant organization, is reflected in the attitude of the community toward the new company."

Mr. Rogers considers product improvements as developed by Texas Industries to be evolutionary rather than revolutionary. He believes that all worthwhile developments come from what he calls a slow but consistent piling of progress upon progress. And he is enthusiastic about the value of the central laboratory maintained at the Texcrete plant in Dallas. This laboratory is managed by Zane P. Laurini, engineer in charge, and is under the direction of Cedric Willson.

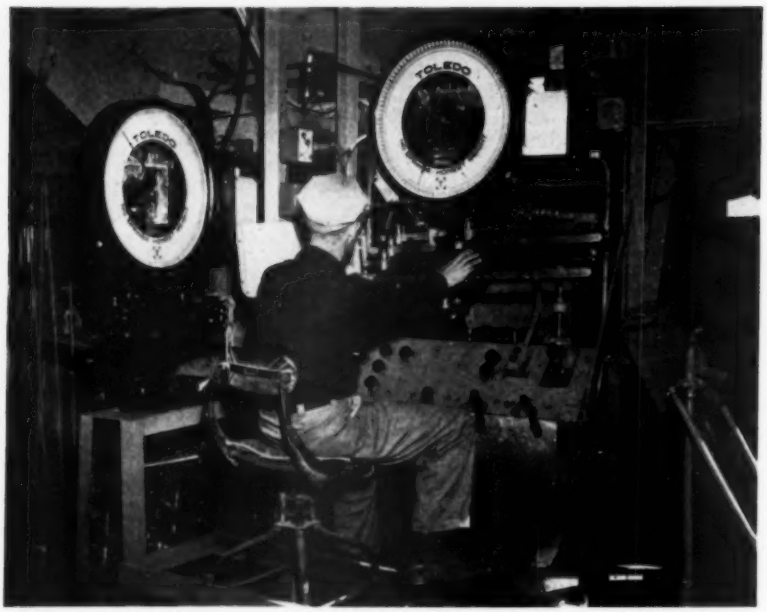
Geo. A. Meihaus, Jr., vice-president

Laboratory Developments

Many product improvements have been developed in this laboratory and put to practical use in the various plants. Some improvements in quality have simply been the results of changing of manufacturing techniques, such changes being based on laboratory findings. Other improvements have come from more careful selection and better grading aggregates.

The company feels that research and development work done by Texas Industries is benefiting the entire concrete industry in the Southwest. "Texas Industries has long believed in building up the industry as a whole and thereby building a greater potential market for all," Mr. Rogers explains. "Adhering to this policy, all developments coming out of Texas Industries laboratories are not only passed along to our own plants but are made freely available to anyone in the industry. We believe that by following this policy we have been able to improve considerably the general standard of quality of concrete block in the Texas and Louisiana area."

Texas Industries makes consistent use of the laboratory facilities to maintain quality in all its plants. According to the corporation's 1953 annual report, "One of the more significant accomplishments of the engineering division during the year was a new method of quality control and a system of continuous follow-up laboratory checks." As a part of this plan every plant is supplied with heavy wooden boxes in which to ship representative samples of its various products to the central laboratory at least once a month. The laboratory makes quality control checks on compressive



Automatic control equipment for mixing a batch of concrete at Sixth street plant, Fort Worth Sand & Gravel Co.

strength, absorption, shrinkage, color and texture. Each plant also utilizes the services of a local independent testing laboratory.

"Uniform high quality," the company's annual report says, "means consumers can rely on the same standards of dependability in all products of Texas Industries, Inc., no matter where bought."

In addition to certain special facilities, the Dallas laboratory is equipped to make all A.S.T.M. tests and tests under recommended procedure of the National Bureau of Standards. Laboratory equipment includes an 8-ft. x 24-in. autoclave with a 200 p.s.i. rating at 384 deg. F. This equipment is being used for experimental work on high pressure steam curing of block. Other laboratory equipment includes a 300,000-p.s.i. two-dial compression testing machine; a 60,000-p.s.i. compression testing machine; a rotary pilot kiln 18-ft. x 30-in. for experimental work on lightweight aggregates; a 2500-deg. Lindberg electric furnace; standard drying ovens and a Sweco separator.

Standard Curing Practice

All Texas Industries plants are following a standardized procedure in curing and other manufacturing steps as far as possible. Curing is done with steam at atmospheric pressure. All plants have modern steam curing rooms. Special studies of steam curing facilities were made during the year. These studies, according to the company's annual report, enabled products plants to adopt a more efficient curing cycle and to improve their products at lower manufacturing cost.

"Precast products are steam cured a minimum of eight hours before being placed in the yard for storage," vice-president Clark says. "All units are stored in Texcrete yards for at least a 30-day period before being delivered to the job site. In some of the Texas Industries' larger plants we have extensive covered storage areas. In some of the plants tarpaulin covers are being used. When a customer requires a block with a moisture content lower than that of the average relative humidity, large portable heaters are placed in the curing rooms and, after the 8-hour steam curing period the steam is exhausted and hot air is forced into the curing rooms."

Work on New Products

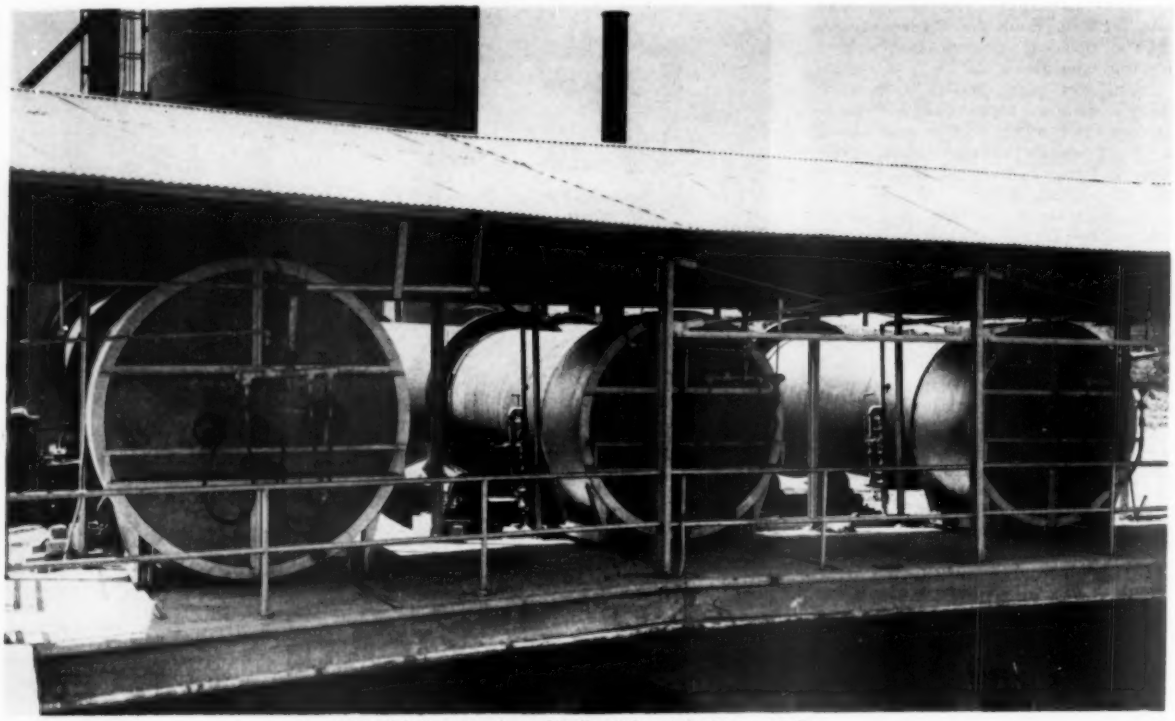
The sales forces of Texas Industries are kept closely in touch with laboratory developments. Intensive efforts are being made to get increased acceptance for the various products in all the sales territories.

The laboratory has been very busy on the development of new products to be added to the Texcrete line in 1954. It is thought that these new products will not only develop additional sales volume of themselves, but

Sakrete, pre-mixed dry concrete being bagged at Hurst plant of Texas Dry Concrete Co., a Texas Industries, Inc. subsidiary

Central Dallas laboratory of Texas Industries. A technician is checking linear shrinkage of block with a strain gauge

Another view of laboratory showing precast lintel being tested for compressive strength on 300,000-lb. testing machine



Three-kiln Haydite plant of Dallas Lightweight Aggregate Co.

will stimulate acceptance for other products which have been made for a longer time.

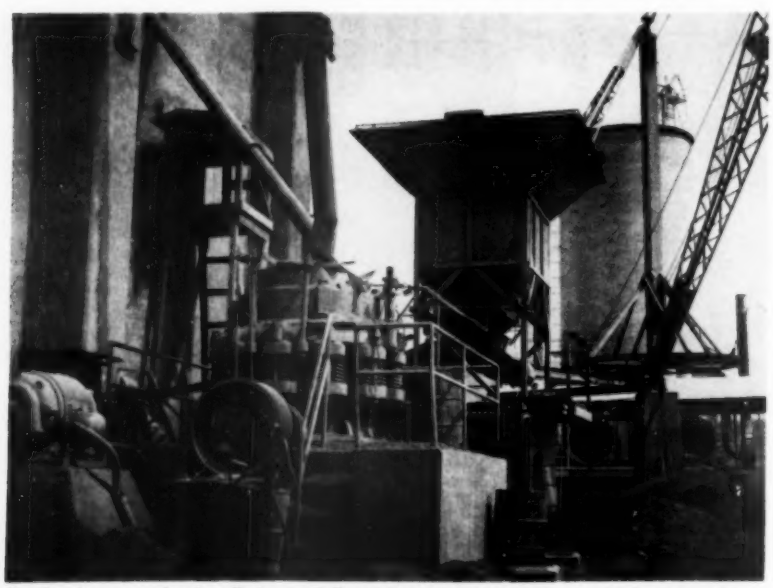
In the field of new products the company's 1953 annual report says that its engineering department was successful in producing a satisfactory lightweight concrete pipe weighing one-third less than standard heavy concrete pipe. "A careful investigation of the possible advantages and potential market is being made," the report says, "before placing lightweight pipe on the market."

Studying Prestressing

The company engineers have also begun a thorough investigation of the possibility and practicability of prestressing lightweight concrete, it is learned from the 1953 report. "At the end of the year," the report says, "plans for a comprehensive testing program were complete. Tests under way will be completed early in 1954."

Texas Industries is now instituting a carefully prepared system of selling and sales supervision for its Texcrete companies. This is built around a series of nine lectures illustrated with appropriate slides. These slide lectures are being used as refresher courses for the older salesmen, the training of new salesmen and, in some instances, for presentation before groups of Texcrete customers.

As a part of the advertising and merchandising effort being put behind all Texas Industries products, the entire fleet of more than 300 Texcrete trucks operating out of all plants is being painted a highly visible orange shade with black lettering. Texcrete signs in the same color scheme are available for use on construction jobs and on various pieces of Texcrete plant equipment.



Shorthead cone crusher installation at Dallas Lightweight Aggreate Co. In the background is a feed hopper, hoist, and 1600-cu. yd. shale storage silo

Public Relations

Texas Industries, Inc. maintains an active public relations department in the Dallas headquarters. This department operates on a policy-making level with top management. Charles Yeager, public relations director is a member of President Rogers' staff. The department's services are available to the company's individual plants in Texas, Louisiana and Oklahoma divisions.

Public relations objectives include publicizing the advantages and acceptance of all the company's prod-

Production of Haydite began in March, 1953 at the Dallas Lightweight Aggregate Co. To the left is the cooling stockpile of aggregate before crushing. Storage silo for finished aggregate is 80 ft. high. In the background is the 700-ft. belt conveyor that carries Haydite to Texcrete Co. bins

ucts; emphasizing the fact that Texas Industries, Inc. is a sound and well-managed company, a good citizen in the local communities in which it operates and a good place to work.

Through field and other investigations, the public relations department endeavors to keep management informed on trends and attitudes which might affect public acceptance of the company and its products.

Most of the public relations effort is aimed at five primary publics: (1) the people who own the company, stock and bond holders; (2) customers and prospects for the products; (3) employes; (4) influential citizens in communities in which the company operates plants, and; (5) the general public.

To date the primary promotion problem has been to overcome the unfamiliarity of architects, engineers, contractors and builders in this area with the advantages of Haydite aggregate and Texcrete lightweight block. Hence primary emphasis has been on technical information and assistance to these people in planning stages and on the job.

Expenditures for publicity and advertising, exclusive of salaries, have been approximately $100,000 a year. It is understood that the advertising budget will be considerably increased when newly developed products are introduced and in full production.

The public relations department prepares the annual report, quarterly reports, letters and special mailings and all material for the information of stockholders. All news stories and special requests for stories and pictures are handled by the public relations department.

Practically all newspaper and periodical advertising is handled by the company's advertising agency which has offices in both Dallas and Fort Worth. Material of a technical nature is developed by the engineering department to be produced by the public relations office.

The general manager of each of the individual Texas Industries plants has his own advertising budget and handles his advertising according to his best judgment. Mailings to customers and prospects from individual plants are handled by the general manager or plant sales manager since he knows his market best. These mailings may consist of technical data, sales letters, magazine reprints or bulletins of the National Concrete Masonry Association. In the Dallas-Fort Worth area, a specially prepared news bulletin, "Building Bull" is mailed monthly to Texcrete customers and prospects.

"Texas Industries Newsletter,"

Close-up of the 800-ft. belt conveyor that carries aggregate from the plant of Dallas Lightweight Aggregate Co. to the bins of Texcrete Co. The conveyor system has loading points for both trucks and rail shipments

mailed monthly, is used to keep widely scattered personnel informed about others in the organization, to improve effectiveness of operation, and to stimulate the spirit of teamwork.

The company is enthusiastic about the results obtained from use of a 27-minute, 16 mm. motion picture in color and sound, entitled, "The Story of Texas Industries." The picture has been used with excellent results in keeping stockholders informed, and in familiarizing architects, engineers and builders with the company and its products. Group meetings at which the motion picture is shown have been held in the most important cities in the area.

Plant additions and improvements were given especial mention in the 1953 annual report of Texas Industries. The capacity of the lightweight aggregate plant at Stafford, Texas, was doubled during the year by the addition of a new rotary kiln.

A new ready-mixed concrete plant was started during the summer at a location on the south side of Fort Worth. Other improvements listed in the annual report include the addition of new high-production Besser equipment, faster material handling equipment, improved block curing facilities, more heavy-duty ready-mixed concrete units; improvement of yard facilities; experiments in the production of slump brick and block; and increased production of foundation vents, sills, lintels and other precast units.

From Clay to Block

ALTHOUGH all the Texas Industries plants are rapidly being modernized where necessary, several are already outstanding in the matter of layout and equipment. One of the most unusual plants in the world is the Texcrete plant on the southern edge of Dallas. This adjoins the plant of the Dallas Lightweight Aggregate Co., also a part of the Texas Industries organization. Shale is mined, processed in kilns, crushed into graded sizes and made into lightweight concrete block or other structural units in one continuous operation at these combined plants. Everett E. Knott, general manager of the Texcrete plant, believes this is the only operation of its kind in the country.

The shale is mined with a ¾-cu. yd. Northwest shovel, dumped over a grizzly to a 24- x 42-in. McLanahan crusher and then to an elevator which carries it into an 80-ft. high concrete storage silo from which it moves by gravity first and then is fed by a variable speed conveyor belt into one of three rotary kilns. There are two 6- x 75-ft. kilns and a 7- x 75-ft. kiln. These kilns were made to specifications of Texas Industries, Inc., by the Standard Tool & Machine Co. of Longview, Texas.

Temperature in the kilns is approximately 2150 deg. F. No coolers are used because it is believed that slow cooling in a stockpile produces stronger clinker. The clinker is discharged from the kiln into a clinker pit from which it is moved by clamshell to a bin over the crushers. The feed hopper to the crushers has a capacity of 22 cu. yd. It was designed by the company's own engineers. Clinker is fed to the crushers by a Syntron vibrating feeder. It first passes over a grizzly with 1½-in. bar spacing. Material passing through the grating goes to a 4-ft. Symons shorthead cone crusher. Oversize clinker goes to an 18- x 30-in. Rogers jaw crusher.

The crushed clinker, now lightweight aggregate, is taken by bucket elevator to a screen room built over the top of an 80-ft. concrete storage silo, the center silo in a battery of three, with a capacity of 1000 cu. yd. In the screen room the aggregate passes over two double deck Jeffrey electric vibrating screens which separate it into ¾-in. sizes for structural concrete, ⅜-in. to a size retained on a No. 4 mesh and from that size down to dust. Any desired blend of sizes can be made on the 20-in. conveyor belt from either of three silos. The belt, which is 700-ft. long, has three delivery points. It can deliver the aggregate to motor trucks, to railroad cars or to the 77-ft. aggregate elevator at the Texcrete plant.

The Texcrete aggregate bin has four compartments, one holding 400 bbl. of cement and three with a capacity for 60 cu. yd. of aggregate. The bin and elevator were designed by the engineering department of the Besser Mfg. Co. and were fabricated by the Allison Steel Co. of Phoenix, Ariz.

Seventy-Nine Shapes and Sizes

The machine room of the Texcrete plant is equipped with two front feed, two-stop Besser Vibrapacs with a combined capacity of 14,000 block in an 8 hr. shift. There is a 50-cu. ft. Besser mixer over each machine. In line with the two block machines there is a Kent Super-Lintelator which casts lintels in various lengths from 3-ft. to 10-ft. A traveling weigh batcher serves the two Besser mixers and a Dodson-McCord 19-cu. ft. mixer over the Lintelator. The plant has 12 steam curing rooms.

Seventy-nine different modular sizes and shapes of lightweight block are made in this Texcrete plant, including brick sizes. A new structural block with a glazed face is also being made. It is being marketed under the trade name "Tex-Tile." This unit is available in eight different colors.

According to Mr. Knott, eight sizes and shapes account for about 90 percent of the plant's sales of block. About 50 percent of the volume is in 8- x 8- x 16-in. units.

One unusual feature of the combined operation of these two plants is a well, 1321 ft. deep which supplies 30,000 gal. of water per day, the requirement of both plants. Two 12,000-gal. storage tanks are kept filled.

The Fort Worth Texcrete Operation

Texcrete block distributed in the Fort Worth area is made in a modern plant with several unusual features.

Precision-made precast treads and risers were produced by the Texcrete division for a gymnasium of the Fort Worth public school system

The batching tower at this plant is 90 ft. high. It was built of concrete cast in slip forms. The cement bins hold 700 bbl. The two aggregate bins have a combined capacity of 650 cu. yd. Materials are delivered in hopper bottom railway cars and carried to the bins by screw conveyor. From the bins the material flows to the weigh batcher by gravity. One late model Besser Vibrapac with magnetic offbearer is operated. The plant makes about the same sizes and shapes of block as are made in the Dallas plant with the addition of long-span concrete joists up to 24 ft. in length. There are five steam curing rooms. The Texcrete yard in Fort Worth is entirely paved with concrete to facilitate handling and storage of finished block.

Push Button Concrete Plant at Fort Worth

Operation of Fort Worth Sand & Gravel Co., now one of the properties of Texas Industries, Inc., was described in detail in ROCK PRODUCTS, July, 1953, page 72.

The Sixth Street plant of this company is said to be one of the most modern ready-mixed concrete plants in the country. It has produced as much as 986 cu. yd. of concrete in nine hours. SC[2] control equipment weighs and proportions all ingredients, including the water in each batch of concrete and makes a printed record of all weights. This control equipment is operated by push buttons, control levers and light indicators. Moisture content of the sand is determined every 30 min.

Large Plant in Corpus Christi

The Corpus Christi plant managed by H. H. Dickehut, Sr., is one of the largest and most modern of all the Texas Industries operations. This plant, occupying a 10-acre tract of land, makes a full line of Texcrete block plus a few specialties and also operates four-machines on concrete pipe. These four machines are set in line in the recently completed machine building.

Tex-Tile block with a glossy cement tile face, is made to compete with glazed tile. Manufacture was started in 1953 by Texcrete Co., of Dallas. It is available in a wide variety of matched and standard colors

Neat plant layout of Texcrete Co. of the Valley, Pharr, Texas

One Quinn machine produces pipe from 21-in. to 72-in. in diameter.

One heavy-duty Quinn machine makes pipe in sizes from 30-in. to 84-in.

One McCracken machine is turning out sizes from 4-in. to 18-in.

A Champion drain tile machine is also operated on 4-in. to 6-in. tile.

Both plain and reinforced concrete pipe are made. The plant is also equipped to make pipe with Tylox type rubber gasket joints in sizes from 12-in. to 84-in.

Sand and gravel for pipe manufacture is delivered to the plant from a local source in trucks, and is dumped into a screened hopper to an underground pit. A bucket elevator carries the aggregate to a five-compartment aggregate storage bin, 65-ft. high. This has a capacity of 126 tons. Portland cement is delivered in hopper-bottom railroad cars. A screw conveyor takes the cement to a bucket elevator which carries it to one of three cement storage compartments. Two of these compartments have 135 bbl. capacity and the third will hold 665 bbl.

A 40-cu. ft. mixer is operated behind each pipe machine. These mixers are fed by two traveling batchers of 2-cu. yd. capacity on an overhead crane way.

The lightweight aggregate with which the Corpus Christi plant makes concrete block is shipped by rail from the Texas Industries' aggregate plant at Rosenberg. It is unloaded by clamshell bucket into overhead bins. There are two aggregate compartments each holding 50-cu. yd. A weigh batcher feeds into a 50-cu. ft. mixer which serves the modern Besser Vibrapac block machine.

In addition to Texcrete block, the plant also makes septic tanks and 12-ft. concrete runners on which oil field pipe is stacked.

There are eight steam curing rooms, four for pipe and four for block. Pipe is steam-cured for 8 hr. at 110 deg. F. and then water sprinkled for three days. Block is steam-cured at 180 deg. F. for 8 hr. The steam is then cut off and the block allowed to soak in the curing room for another 2½ hr. Block is yard-cured for 30 days before deliveries are permitted.

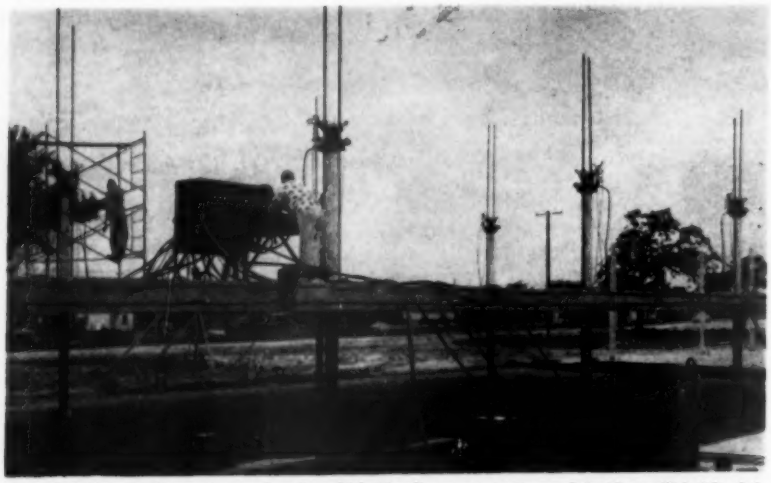
Two Hyster mobile cranes, one a Model 150 and the other a Model 175 are used for handling pipe in the yards. A Towmotor Model 480 P. and a Towmotor Model LP 44 are used for handling block.

A 6 ft. long section of 72-in. concrete pipe, mounted on a high pedestal built of concrete masonry units, is a dramatic and attention-getting sign at the plant entrance. The Texcrete name is emphasized in colored neon lights.

San Antonio Operation

Another Texas Industries property making both concrete block and concrete pipe is the plant of the Texcrete Co. of San Antonio, of which Charles M. Leake is general manager. At the time this operation was visited, in November, 1953, 9000 lineal ft. of 42-in. concrete pipe had just been delivered for the H. B. Zachry Co., San Antonio contractors. This pipe was produced at a rate of 350 ft. per day on a heavy-duty Quinn machine. The same machine can make pipe in 6-ft. lengths in diameters from 30 in. to 84 in. Two other pipe machines, a Universal making pipe from 18 in. through 27 in. in diameter and a McCracken making sizes from 4 in. through 18 in. are set in line.

After extensive remodeling which was underway in November, all three machines will be set under overhead bins and one weigh batcher will charge the mixer for each pipe ma-



City of Dallas service center project in which Haydite concrete is used in Youtz-Slick lift slab job. Roof and floor slabs are poured on the ground, then jacked up and fixed into place by welded steel collars

chine. Before this remodeling was completed sack cement was used, aggregate was delivered in cars, unloaded with a dragline and then delivered to the mixers with a front end loader. There will be eight curing rooms for pipe.

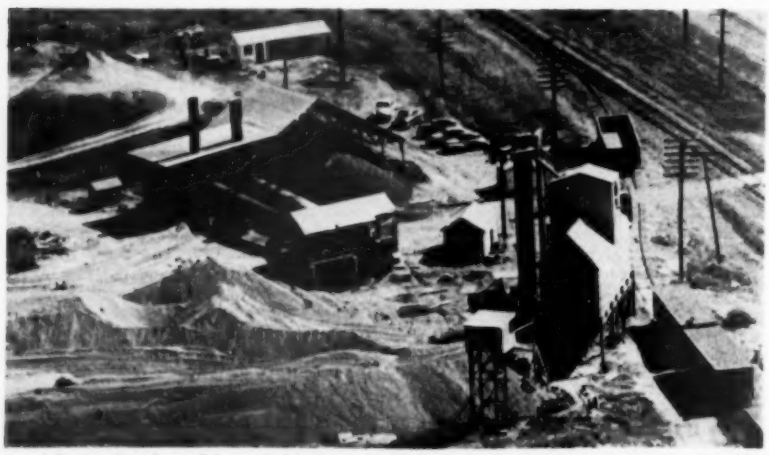
In the block plant, bulk cement and lightweight aggregate are received in hopper bottom cars. A 60-ft. batching tower has a cement bin of 300-bbl. capacity and four aggregate bins each holding 50 cu. yd. The cement is unloaded with a screw conveyor. A 24-in. belt conveyor carries the aggregate from the pit under the car tracks to a bucket conveyor which takes it to the bins in the batching tower.

Two Besser Vibrapac twin stop machines are being operated. One is a new Super Model. According to Mr. Leake, these two machines can turn out 12,000 8- x 8- x 16-in. equivalent units in an 8-hr. day. There are 10 curing rooms for block. Approximately the same ratio of sizes and shapes is made here as in other Texcrete plants. From 500,000 to 750,000 block are stockpiled. Texcrete Company of Austin, of which James A. Jones is general manager, is a distribution center for products of Texcrete of San Antonio.

Show Plant at Pharr

The Pharr plant of the Texcrete Company of the Valley, formerly Builders Supply Inc., is one of the most attractive and most efficiently laid out concrete block plants in the Texas Industries group. Howard A. Smith, the general manager, insists on good housekeeping and perfect cleanliness in every department.

An attractive patio fence runs along the plant property on the side toward the heavily-traveled U. S. Highway 83. At night the property is flood lighted with high-intensity lights mounted on 30-ft. poles, the stockpiles of block being so arranged as to produce a highly dramatic effect.



Two-kiln Haydite plant of Texas Industries at Stafford, serves the South Texas market. The sales office is in nearby Houston

The plant office building, 30-ft. square is of itself a demonstration of the versatility and attractiveness of lightweight concrete block. This building contains an elaborate display showing the various types of block and their use in different styles of masonry coursing and colors.

One Besser Vibrapac block machine with magnetic off-bearer is being operated entirely on lightweight block. Production rate is about 6000 block in 8- x 8- x 16-in. equivalents in an 8-hr. day. Five curing rooms are used, curing being with low pressure steam in about the same curing cycle as in other Texas Industries block plants. Lightweight aggregate is delivered from the Rosenberg plant of the parent company in gondola cars. It is unloaded into ground bins with a dragline. A Butler car scoop takes the aggregate from the ground bins to a bucket elevator which conveys it to one of the two 12-cu. yd. overhead bins above the weigh batcher.

Cement in cloth sacks is delivered in box cars. About 1500 sacks can be stored at the plant. Ten cars of aggregate can be stockpiled.

Most Diversified Operation in Louisiana

The most diversified operation in the Texas Industries group is at Alexandria, La., where Leslie D. Fain is general manager. Here on a single site within the city limits of Alexandria, a two-kiln operation produces lightweight aggregate from clay; a complete line of lightweight concrete masonry units is made on a modern Besser Vibrapac machine; a Quinn and a McCracken pipe machine make a full line of concrete pipe, and a modern ready-mixed concrete plant is in full production. This plant was formerly Louisiana Lightweight Aggregates, Inc., and the Central Culvert Corp.

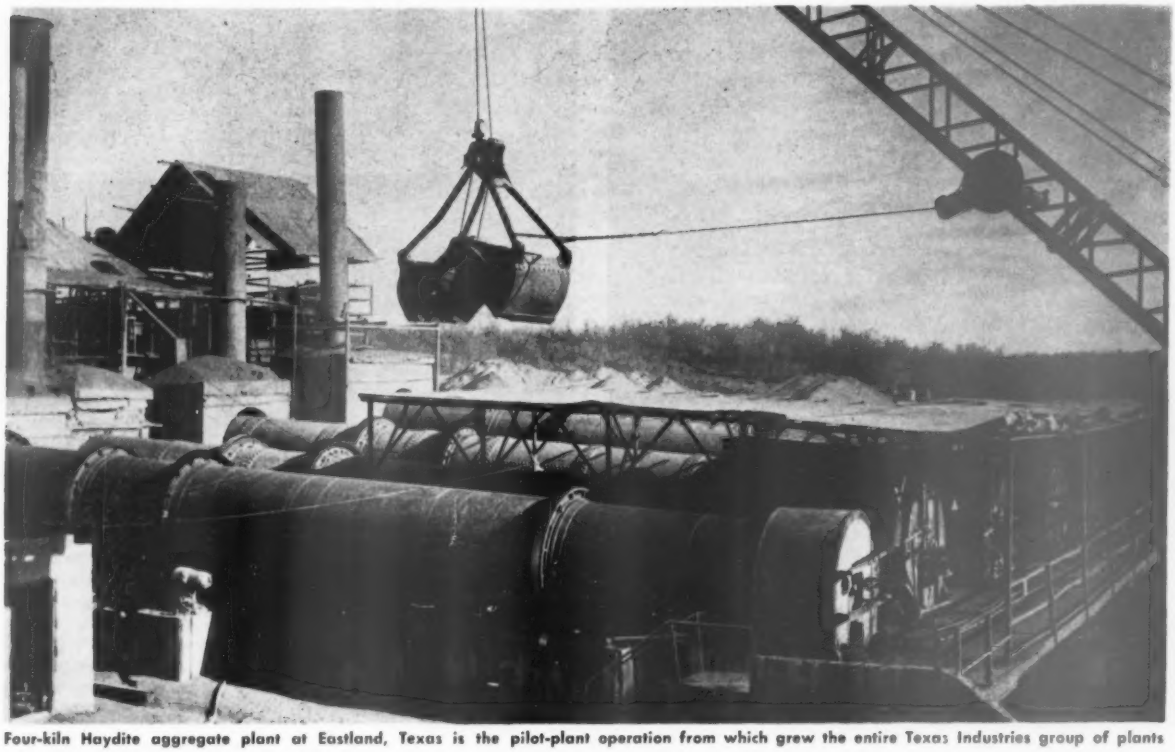
Shreveport Operations

The Texcrete Co. of Shreveport, La., of which John W. Porter is general manager, makes lightweight concrete block on a Besser Vibrapac machine and operates three concrete pipe machines. Lightweight aggregate for the block is shipped from the Texas Industries aggregate plant at Alexandria, La.

Texas Industries has recently acquired a plant site at Monroe, La., and is constructing buildings and installing machinery for the manufacture of concrete pipe.

The capacity of the concrete pipe machinery in operation in Texas Industries plants at the end of 1953 was well over 36,000 tons of pipe per month.

Methods of operation and the type of equipment used in the lightweight aggregate plant at Dallas have already been described in detail. Methods and equipment in the other light-



Four-kiln Haydite aggregate plant at Eastland, Texas is the pilot-plant operation from which grew the entire Texas Industries group of plants

weight aggregate plants of the Texas Industries group are as follows:

Plant Equipment

At the Eastland plant shale is mined with a ½-cu. yd. Lorain shovel.

At the Rosenberg plant, clay is mined with a Miller rotary scraper pulled by a 60-hp. tractor.

At the Stafford plant, the clay is mined with a Case LIA tractor pulling a Gar Wood scraper.

At the Choctaw, Okla., plant the clay is mined with the same equipment as at Stafford.

At Alexandria, La., clay is excavated with a dragline.

At Eastland a single roll 24-in. x 42-in. McLanahan shale crusher.

At Rosenberg, a J. C. Steele shale disintegrator.

At Stafford no raw clay crushing is required as clay is broken up by scarifiers as it is mined.

At Alexandria, La., clay is broken up by modified pug mill and is then put through a dryer.

At Choctaw, Okla., as at Stafford, no clay crushing is required.

At Eastland—4 kilns 6- x 60-ft.

At Rosenberg—2 kilns 6- x 52-ft.

At Stafford—2 kilns 6- x 60-ft.

At Alexandria—2 kilns 5½- x 50-ft.

At Choctaw—2 kilns 6- x 75-ft.

At Eastland—4-ft. SH Symons cone, and 18- x 24-in. Jeffrey hammermill.

At Rosenberg—18- x 30-in. Pioneer double roll, and Jeffrey hammermill for secondary crusher.

At Stafford—Basic crusher is Riddell rim grinder. Secondary is 16- x 26-in. Universal double roll crusher.

At Alexandria—7-ft. dry pan. Secondary is smooth face double roll.

At Choctaw—Primary is Jeffrey double roll crusher. Secondary is 18- x 24-in. Jeffrey hammermill.

Most Texas Industries plants have Jeffrey electric vibrating screens. The usual combination is an FB-2 for the coarse and medium grades, and an FB-4 to separate the fine material.

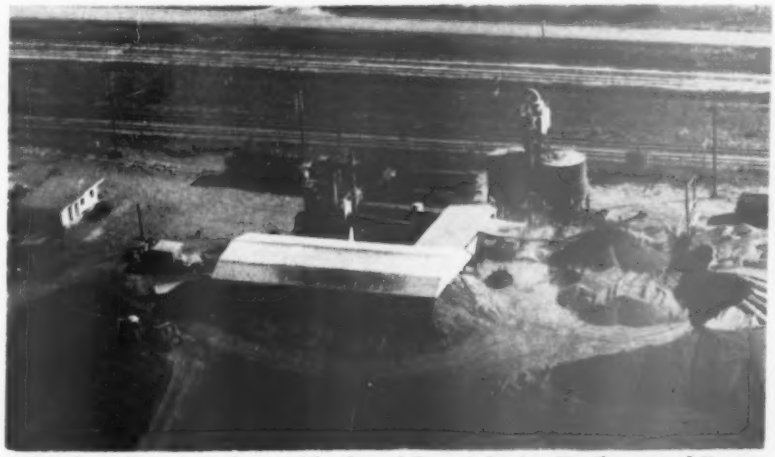
At Alexandria, Rosenberg, and Stafford, bins are elevated and built of structural steel.

At Eastland, bin is concrete masonry on ground with tunnel containing belt conveyor to elevator.

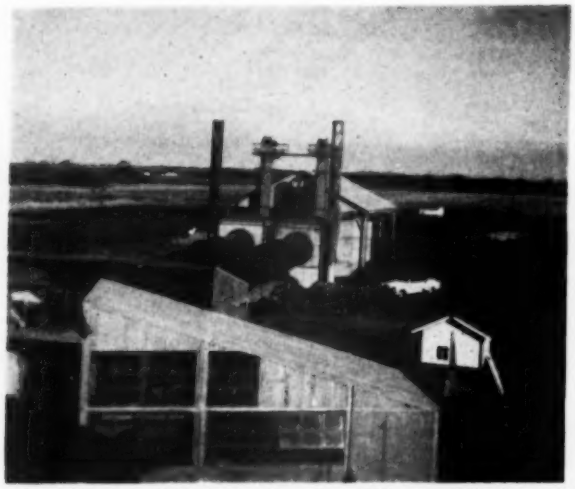
At Choctaw the loading conveyor runs in a tunnel beneath a steel silo with concrete wing walls.

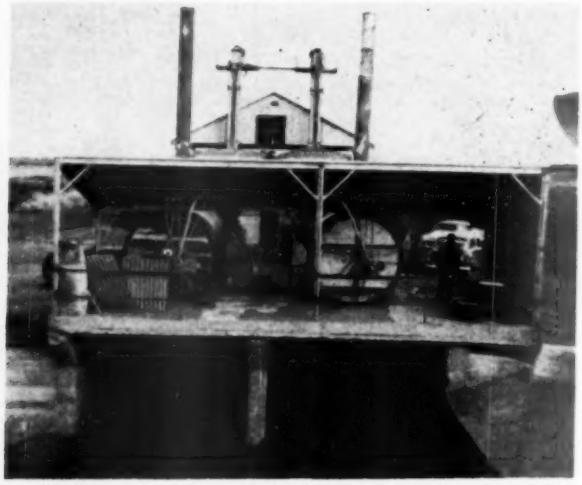
Board of Directors

Members of the board of directors of Texas Industries, Inc., include: Mr. Rogers and Mr. Erringer, Dallas; W. W. Caruth, Jr., Dallas; Lawrence A. Hart, Dallas; Henry C. Hofheimer, II, Norfolk, Va.; Edward H. Jackson, Shreveport, La.; Bernard F. McLain, Dallas; George L. Noble, Jr., Washington, D. C.; James H. Snowden, Fort Worth; Frank E. Wallace, Dallas; Albert G. Blanke, Jr., St. Louis; Rife R. Saunders, Alexandria, La.; and Dr. William H. Pierson, Natchitoches, La.



At Rosenberg, Texas is another two-kiln plant of Texas Industries, 32 miles west of Houston





Left: Looking toward feed ends of two 6- x 75-ft. rotary kilns for production of lightweight aggregate. Each kiln receives feed from bucket elevator. Right: Firing end of kilns with hot clinker pit in foreground

Newest Lightweight Aggregate Plant In the Southwest

By TIP BROWN

NEWEST of the lightweight aggregate plants in the Southwest is the Oklahoma Lightweight Aggregate Co. development at Choctaw, Okla., on the Rock Island railroad 16 miles east of Oklahoma City. It is the first producing plant in the state, and also the first to tap the black alluvial clay deposits of Oklahoma for this purpose. The Choctaw location was selected after months of research work, and building was started in April, 1953. The 90-acre property has 4- to 8-ft. thick beds in the deposit. The experience of the parent company, Texas Industries, Inc., Dallas, which also operates lightweight plants in Texas and one in Louisiana, has been turned to good account in the Oklahoma plant, and has resulted in a simple design and operating features that insure smooth running and uninterrupted production.

Simplied Manufacturing Steps

Raw materials are obtained by scarifying an exposed area of the deposit and, after air drying, removal to plant storage by tractor and scraper. Space is available for 1000 cu. yd. and approximately one third of the storage is under cover in a structural steel and sheet metal enclosed, open-end building. Underground belt conveyors transport raw materials from storage to bucket elevators that discharge into two 6- x 75-ft. rotary kilns, gas-fired to 2000 deg. plus temperature in the hot zone. The combined kiln production is 180 cu. yd. daily from round-the-clock operation. Kilns discharge into a 20- x 40-ft. open pit, from which the calcined material is picked up by a Clyde stiff leg crane with 2-cu. yd. clamshell bucket and placed in an open stockpile for storage and cooling.

The same crane again handles the clinker into a hopper over a double roll Jeffrey crusher from which it

Left: Loading finished material into railroad car. Tank is for fines storage. Right: Initial scarifying operation before excavation of deposit

passes to two double-deck screens that separate the crushed material into fines, ⅜-in., and ¾-in. sizes. The larger sizes move by chute to open storage, and the fines are stored in a covered steel silo-type bin, 18-ft. in diameter by 24-ft. high. Oversize material on the screens is returned to the roll crusher for regrinding and rescreening. A Jeffrey hammermill receives material between ¼-in. and fines from the lower screen and reduces it to fines.

Outstanding economies have been realized in the swinging type Clyde stiff leg crane which performs yeoman service, from a stationary location on three concrete piers, in cleaning out the accumulated clinker in the storage below the kilns and in feeding the materials to the crusher. Operation is by individual electric motor. Natural gas for kiln firing is obtained from a pipe line which crosses company property about 600 ft. from the buildings.

Shipments are made by both rail and truck. A belt conveyor in the tunnel beneath both the open and the covered storage carries the specified finished material to a loading position for both open type hopper and gondola rail cars and to trucks on an adjacent roadway. An 8-in. swinging rubber spout discharges to both types of transportation.

Shipping and Distribution

The Oklahoma City market is a major outlet for the product, and the first carload of material was shipped November 23, 1953, to the Harter Marblecrete Stone Co. at Oklahoma City. Demands for aggregate going into structural concrete, concrete block, and for ready-mixed concrete plants can be adequately served within a considerable radius of Choctaw. Extensive tests of the finished products in the commercial laboratory of the Oklahoma Testing Laboratory and the private laboratory of Texas Industries, Inc. have demonstrated full compliance with all standard specifications for both commercial and structural uses.

Personnel

Officers of the company are: Ralph B. Rogers, president; Alexander R. McVoy, vice president; Charles E. Marshall, vice president and assistant treasurer; Russell E. Kibbe, Jr., treasurer and assistant secretary; Harold B. Pressly, Jr., secretary; all of Dallas, Texas.

Mr. McVoy is in over-all charge and worked out engineering details of the plant. L. M. Harris is the plant superintendent and M. F. Flinn was construction superintendent. A sales office has been established in Oklahoma City, in charge of Stanley G. Gerlach, well-known in the building industry from his recent association with The Dolese Co., Oklahoma City. Skilled employes have been trained at the plant, and the operation requires some 17 men.

Rocky's Notes

(Continued from page 59)

physical properties. For example, quoting again from the text: "The structure types occurring in essentially ionic crystals depend considerably on relative values of the ionic radii. Generally the greatest stability of crystals is obtained when the smaller ions are completely surrounded by the larger ions, but are still in contact with these nearest neighbors. This geometry requires that the larger ions form a coordination polyhedron around the central ion in such a way that the space at the center of the polyhedron is at least filled by the central ion." We have described how the ion of silicon is enclosed in a closely packed tetrahedron of oxygen ions, which accounts for the extraordinary toughness, strength and durability of the mineral silica (quartz). In general the goodness of a bond of this kind is determined by its length—the shorter the better.

Nuclear Chemistry

Presumably one can not fully understand structural chemistry without some comprehension of nuclear chemistry, which concerns the fundamental properties of the nucleus of an atom. Much has been learned, and much that has been learned has been applied, in the manufacture of radioactive materials of which the A-bomb and the H-bomb are illustrations. However, it was chiefly through research on such substances that the structure of atoms generally was determined. This part of the text may become useful to researchers in cement and concrete if use of radioactive isotopes of some of the common elements is made to trace the ionic movements of such disintegrating elements as sodium and potassium through solutions in concrete. The last section of the book on "The Actinite Series" deals with the heavy elements—the transuranium elements, some of which do not exist in a natural state. Their structure is of interest mainly to students and researchers in atomic power development.

Summarizing, we can hardly do better than the publisher: "This first volume builds a firm foundation for the entire series by furnishing a well-rounded, concise account of atomic structure. It pays particular attention to electronic configuration, to serve as a point of departure for the discussion of molecular structure. The various types of bonds existing in molecules are described in the light of present-day concepts and such important topics as resonance, the metallic bond, and disorders in crystals are clearly presented." The term resonance may scare the uninitiated, but it means chiefly a bonding link that readily changes its position. The hydrogen bond in water, discussed in the article in the January issue of the series on "Prosepctive Chemistry of Cement and Concrete," is an example of the concept of resonance.

Installing 400 ft. of 60-in. concrete pipe, fitted with rubber gasket joints, which will be subject to a 45-ft. surge pressure. The pipe was made by Texcrete Co. of Corpus Christi for the Central Power and Light Co., power station project

Silica Sand

A NEW AND UNUSUAL use for silica sand was recently announced by the Illinois State Geological Survey in its Report of Investigations No. 168, on "Illinois Mineral Industry in 1951 and 1952." According to the report, Standard Silica Co., Ottawa, Ill., under the tradename Hydrox Frax, produces a uniformly graded sand which has been successfully used in the mid-continental oil field to increase flow from largely depleted oil-bearing strata. The sand is pumped into wells under pressure of 5000-8000 p.s.i., with jellied gasoline being used as the carrier. The sand penetrates into oil-bearing beds and aids in opening up fractures and increasing the size of the pore spaces. This makes possible the salvage of otherwise unrecoverable oil.

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TO ADD AN Eagle WASHING-CLASSIFYING-DEHYDRATING SECTION TO ANY AGGREGATE PLANT!

Regardless of the gradations of material you are producing, or desire to produce, there is a complete, compact Eagle Washing-Classifying-Dehydrating Section that can be readily added to your plant. Typical sections consist of an Eagle Water Scalping Tank, Collecting-Blending Flume and either one, two or three Eagle Double Screw, Long Weir, Fine Material units, or—as in the case of Holliday Sand & Gravel Co., Bonner Springs, Kan., pictured at left—two double screw fine material units and a single screw coarse material washer with trash remover tub end. Combinations to meet any requirement.

Holliday's is a pumping operation, but Eagle Sections are in use at numerous dry pit operations as well. Sections are furnished complete with structural supports, pump box, screen supports—ready to install in a minimum of space—easy to connect to your plant circuit.

Eagle Sections are "right as rain"—the many in use proves their case. Design, construction and application is based on over half a century of experience plus studies made with a pilot plant at our "proving ground" adjoining our factory.

Holliday Sand & Gravel Co. USES AN EAGLE "Swintek" DREDGING LADDER TOO!

To dredge materials Holliday uses an Eagle "Swintek" Traveling Screen Chain Dredging Ladder on their dredge, the "business end" of which is pictured at right. The "Swintek" keeps boulders and debris out of the suction line thus eliminating shut-downs and it agitates the deposit thereby increasing the ratio of solids to water pumped. Catalog 83 tells the whole story!

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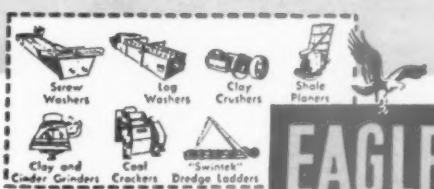

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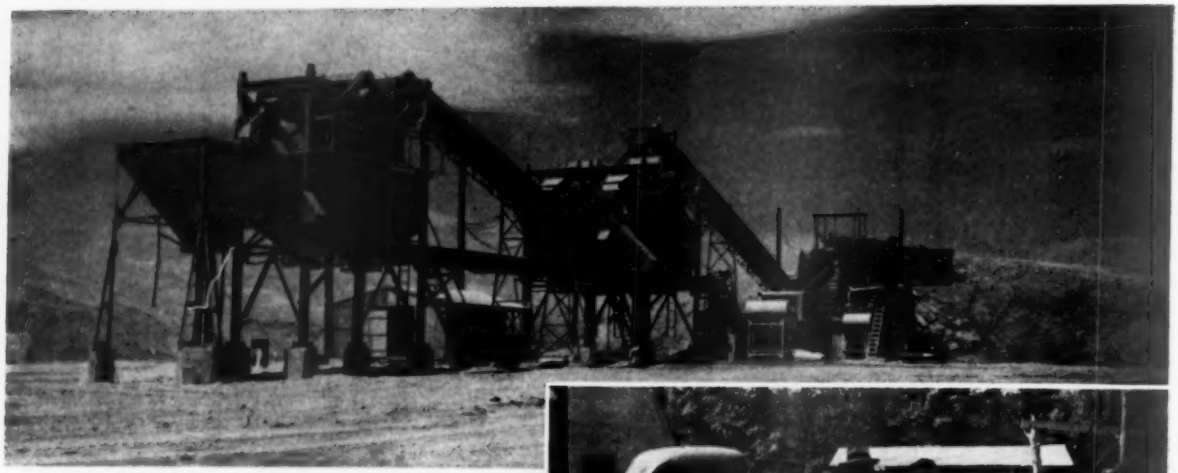
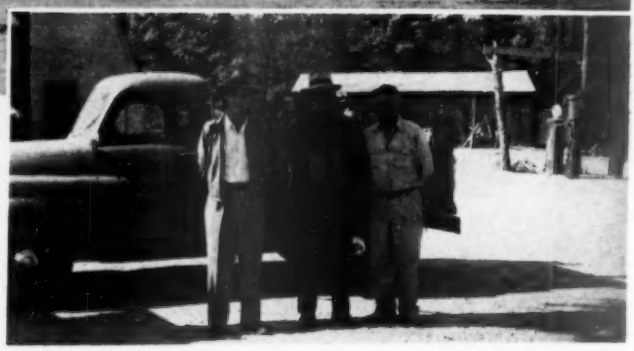




Above: Overall view of plant, looking toward impact type primary crusher. Note long return belt conveyor to secondary hammer mill raised about 12 ft. above ground level so that trucks have ample clearance to move under bins and conveyors

Right: Operators of quarry: left to right, Ray Cook, Jr., office manager; Ray Cook Sr., owner; and George Upton, quarry superintendent

From Portable to Stationary Operation

Ray Cook Construction Co., Ames, Iowa blasts hard clay overburden to facilitate excavation. New crushed stone plant supplies its own power requirements

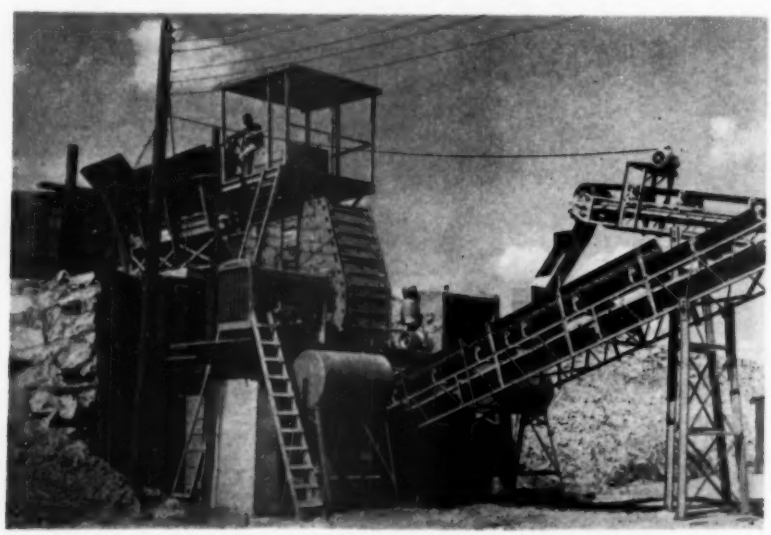
By RAY C. GIDDINGS

A RECENTLY COMPLETED CRUSHED STONE PLANT of the Ray Cook Construction Co., Ames, Iowa, represents the first completely stationary plant built by a company that has operated portable units for many years. The new plant was built to increase size ranges of crushed stone which are in greater demand, and to increase the overall production. Capacity is from 200 to 250 t.p.h. depending on the size range of stone in process.

Deposit overburden, having an average depth of 35 ft., is composed of a heterogeneous hard clay which requires blasting to loosen.

Using a Hardscogg-Cardox drill, a series of 6-in. holes are drilled 40 ft. horizontally into the face of the overburden. Lateral spacing is 20 ft. on centers at a point 12 in. above the bottom of the overburden. The holes are loaded to within 18 in. of the face with 4½- x 16-in. 30 percent dynamite.

Two E-9 Tournarocker units with 11-cu. yd. capacity are used to carry away overburden and also to haul broken stone to the primary crusher. The producer is fortunate in having a market for borrow fill earth thus eliminating considerable extra handling of overburden. Fill earth for immediate delivery is loaded by power shovel into highway trucks. Cleaning the area prior to drilling the stone is done by a ripper and Caterpillar 60 scraper.



Two diesel engines supply power for the double-impeller impact type primary crusher

Drilling and Blasting

Drilling and blasting are done in two benches of 12 ft. each using wagon drills. Drill holes are spaced 6- x 6-ft. with alternate holes staggered, and the practice is to fire two or more rows per blast. A heavier charge is required for the lower

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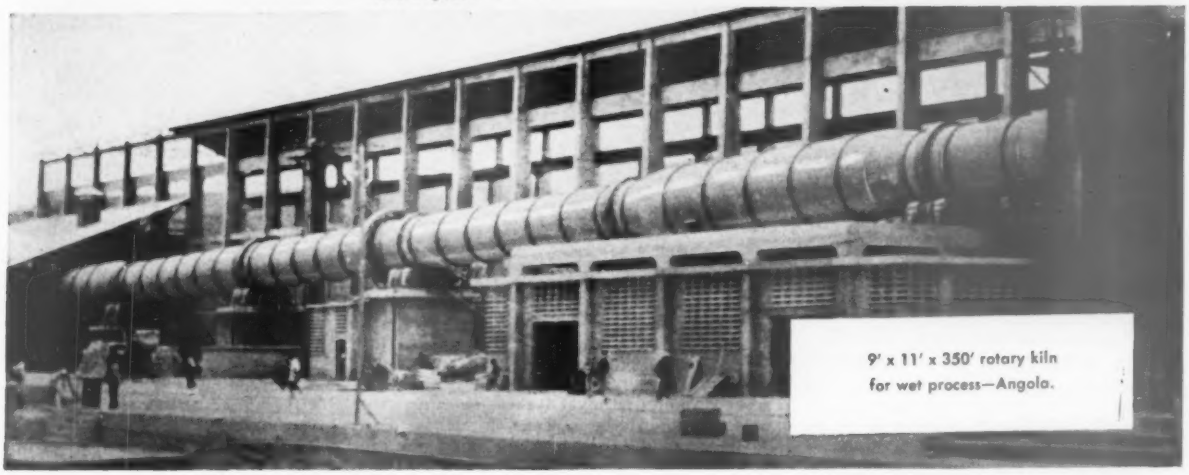

9' x 11' x 350' rotary kiln
for wet process—Angola.

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The KVS trade mark on machinery means *the best!* Over the years, in service all over the world, KVS provides *extra* dependability and has earned the confidence of users everywhere.

Our Sales-engineering department can help any producer choose the right machinery and equipment. Consultation with our engineers anywhere, anytime! Get the KVS story first and be sure!

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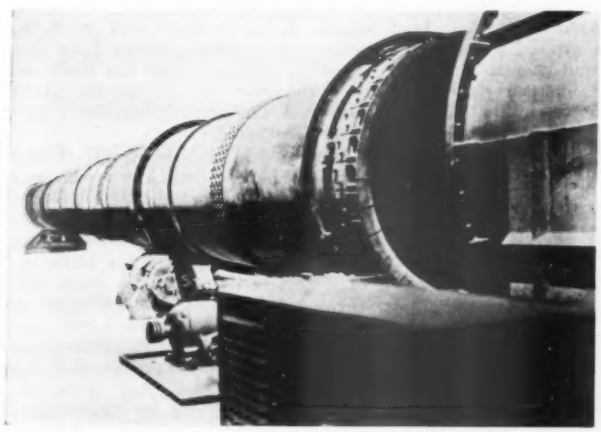

8' x 150' rotary kiln equipped
with high alloy nose rings.
La Cemento Nacional, Ecuador.

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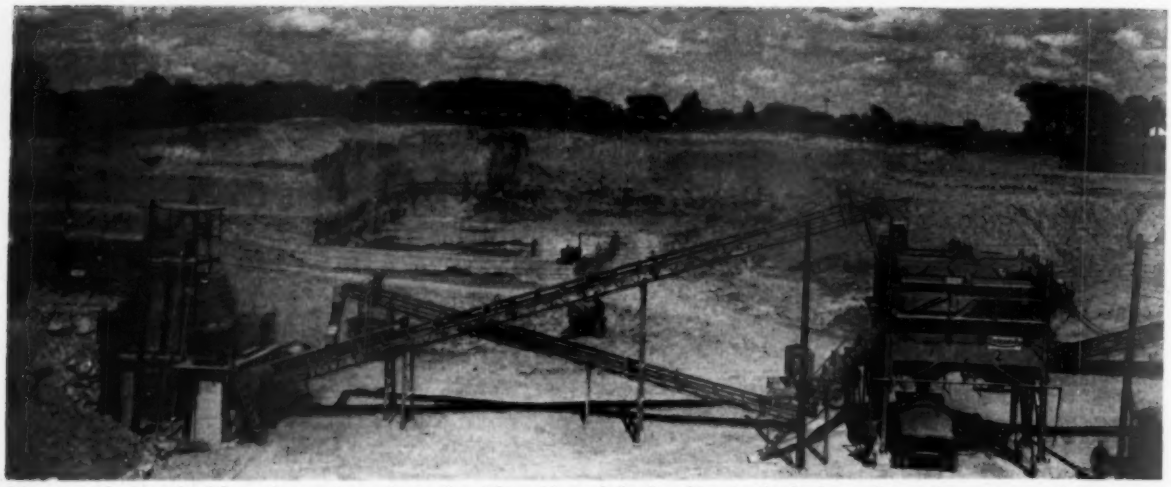

Primary crusher, to the left, and screening unit, to the right, with truck loading bins. In the background may be seen part of the quarry

bench due to increased toughness of the rock. Secondary drilling is done with a jack hammer.

Stone from the quarry is hauled to the plant and dumped onto a 42-in. x 14-ft. apron feeder which regulates the rate of feed into the crusher. Heavy link chain suspended across the mouth of the feed chute absorbs the impact of any rebounding rock.

Crushing and Screening

For primary crushing, a 40-40 Cedarapids double impeller impact breaker was selected to yield a greater range of sizes and give better material control for this particular operation. Each impeller is V-belt driven by a Caterpillar D-326 diesel engine.

The primary crusher is set for a reduction to a 3-in. top size. The primary crusher product discharges to a 36-in. belt conveyor, 100-ft. centers, that inclines up to a two-way chute which distributes the stone over two 4- x 12-ft. double-deck vibrating screens mounted over truck loading bins. From these screens a minus ⅛-in. product drops into one bin and a plus ⅛-in. minus ⅜-in. size goes to a second bin. Plus ⅜-in. stone is delivered by chute to a 24-in. belt conveyor, 50-ft. centers, which discharges on a 4- x 14-ft. double-deck vibrating screen. Plus ⅜-in. minus ¾-in. from this screen goes into one bin and a plus ¾-in. minus 1½-in. size into another bin. The plus 1½-in. stone is directed into an overflow hopper or is diverted to a 24-in. return belt conveyor, 95-ft. centers, for secondary crushing in a 33 x 40 Cedarapids hammermill driven by a D-337 Caterpillar diesel engine. This long return belt conveyor, paralleling the plant and at a horizontal level, is about 12 ft. above ground to permit trucks to operate underneath.

As required, the screen cloth is changed to produce a minus ¾-in. stone and a plus ¾-in. minus 1½-in., with both the primary screens set to deliver identical sizes into the first bin. Oversize, plus 1½-in. stone, goes by chute to a channel frame 24-in. cross conveyor belt, 10-ft. centers, for transfer to the 24-in. main return conveyor carrying the material to the 33-40 hammermill.

In a third set-up, one of the two double-deck screens produces a minus ¾-in. and a plus ¾-in. minus 1½-in. product. Oversize goes by chute to the main return conveyor belt. The other screen produces a minus ⅛-in. and a plus ⅛-in. minus ⅜-in. product. Oversize stone is carried by the 24-in. belt conveyor to the 4- x 14-ft. vibrating screen located over a second set of 25-ton capacity truck loading bins. This screen sizes a plus ⅜-in. minus ¾-in. product and a ¾-in. minus 1½-in. size. Oversize from this screen is returned over the main return conveyor for recrushing or is stored in the loading hopper, previously mentioned.

With this arrangement, all oversize stone discharged from any screen may be transferred over the 24-in. return belt conveyor for re-processing. Recrushed stone from the secondary hammermill is moved on a 24-in. return belt conveyor to the main conveyor belt that carries the material to the first set of screens.

Materials in excess of daily requirements are stockpiled at the west side of the plant. Reloading from the stockpile into trucks is done with a D4 Caterpillar-Traxcavator with 1 cu. yd. bucket.

Plant production includes minus ⅛-in. material for agricultural limestone, concrete stone, road stone and asphaltic concrete stone. At the time of inspection, most of the equipment required for a new asphalt concrete plant was at the quarry ready to be erected.

A D-13000 Caterpillar diesel-electric unit, with a 104 kv.a. rating, produces 220-440 volts. The main switch panel is located in the power house.

Regular starting sequence is to

Loading rear-dump haulage unit with overburden material. The same type haulage units transport stone which has been blasted to the primary crusher

HANDLING "TOUGH" MATERIALS?-

A 60′ Carrier Natural-Frequency screening conveyor for clay products, with 24″ pan made of ¼″ steel plate.
Capacity: 100 tons of 100-pound material per hour. 5 H.P. drive. Middle section of screen removed to show supporting bridge.

Close-up of drive — note patented drive linkage which always places weight of vibrating pan and conveyed materials on the spring supports, and never allows these loads to be imposed on the eccentric shaft and bearings.

anything that's hot, sharp, powdered, oily, abrasive, sticky, granulated or stringy?

Check These Advantages!

- **LESS POWER REQUIRED**
  (1000 foot-tons per hour per H.P.)
- **LESS MAINTENANCE & DOWN-TIME**
  (Less power + good design = good service)
- **GREATER CAPACITY**
  (From a dribble up to 200 tons per hour)
- **HIGH CONVEYING SPEED**
  (Up to 100 feet per minute, on flat hauls)
- **NO DAMPENING UNDER LOAD**
  (Designed with extra power for specified load, with positive stroke)
- **SELF CLEANING**
  (Continuous smooth trough—no pockets)
- **SCREENS, DEWATERS, SEPARATES, BLENDS, DRIES, COOLS**
  (Combines processing with conveying)
- **WIDTHS FROM 6″ TO 48″; LENGTHS FROM 5′ ON UP**
  (With pans 16 gauge to ½″ plate or heavier, open or enclosed)
- **BALANCED, VIBRATION-FREE UNITS AVAILABLE**
  (For use on ceilings or light floor construction)

Carrier Natural-Frequency Conveyors work on a unique, patented vibrating principle which permits them to handle many materials that are too "tough" for most screw, belt, apron, vibrating and other conventional types of conveyors. These spectacular new conveyors also substitute the natural resonance action of coil springs for brute force. Result—*a tremendous reduction in power . . . far less wear-and-tear . . . and an absolute minimum of maintenance and down-time!*

Carrier Natural-Frequency Conveyors — including vertical vibrating spiral types — are now racking up amazing conveying records for scores of America's biggest, most successful industrials. Let us prove to you that they will move *your* product more quickly, efficiently and economically. *Mail the coupon — no obligation of course!*

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CONVEYORS

Carrier Conveyor Corporation (formerly Whitley-Carrier Co.)
Frankfort Avenue at Clifton, Louisville 6, Kentucky

Gentlemen:

Without obligation, please send me Carrier Natural-Frequency Conveyor Bulletin No. RP-2-4.

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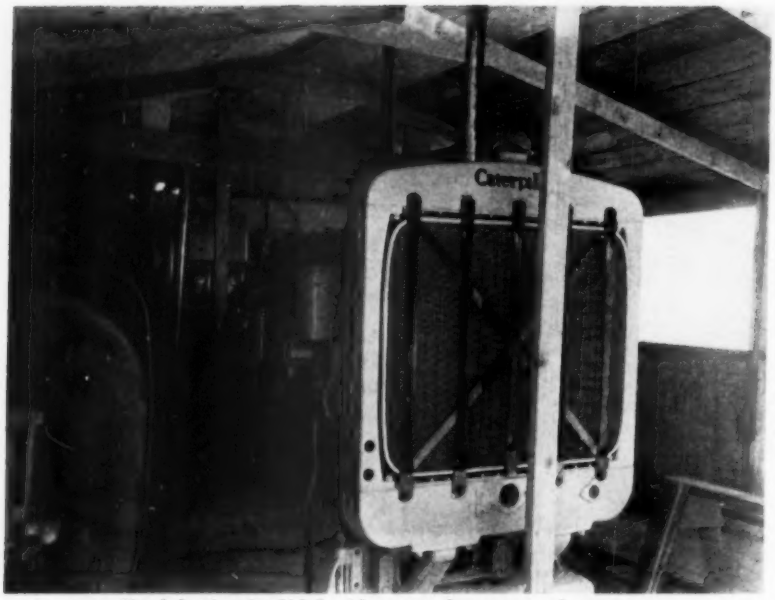


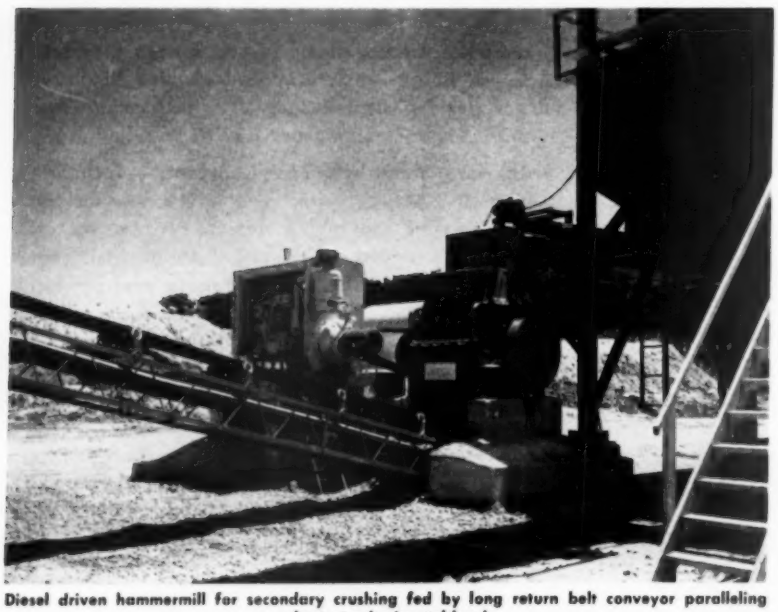
Diesel-electric unit which furnishes power for screens and conveyors

start the two diesels driving the primary impellers and then the hammermill engine. This procedure is followed to prevent choking the secondary crusher with residual material left on the conveyor belts. Next in the sequence is to start the power generator, then the three vibrating screens, the 70-ft. conveyor, the 10-ft. by-pass belt, 50-ft. secondary screen feed conveyor, 95-ft. main return conveyor and the 100-ft. primary belt conveyor. The entire plant is running before any materials are introduced into the primary apron feeder.

Owner, Ray Cook, Sr., started quarry operations over 30 years ago with his first plant located in Nevada, Iowa. In 1938, he moved this portable operation to the present quarry on the bank of the Skunk river 4½ miles northeast of Ames, Iowa.

The new permanent plant was started in 1952 and was just recently completed. Responsible for the engineering and plant layout was Jo Casey of James W. Bell Co., Des Moines, Iowa. All conveyors, screening and crushing equipment were supplied by Iowa Manufacturing Co.

In addition to the permanent plant at Ames, the company operates two portable Pioneer plants in central Iowa. Official personnel in addition to Ray Cook Sr., owner, is Ray Cook, Jr., office manager, Max Cook, in charge of portable operations, and George Upton, quarry superintendent.



Diesel driven hammermill for secondary crushing fed by long return belt conveyor paralleling plant at a horizontal level

Blending Crushed and Natural Sands

THE NATONAL SAND AND GRAVEL ASSOCIATION recently announced the laboratory test results of its investigation of the effects on concrete quality of blending various percentages of crushed sand with natural sand for the fine aggregate. The test was made to determine the feasibility of crushing excess waste sizes of gravel and using the resultant product to augment the supply of concrete sand. In addition to the routine tests for quality of the fine aggregates, non-air-entraining and air-entraining concretes of two richnesses of mix were made in which the quantity of crushed sand was varied from 0 to 100 percent of the fine aggregate. The results of the test were reported as follows:

1. Substitution of the crushed sand for natural sand in amounts up to 100 percent had no appreciable effect on the ability of the fine aggregate to meet conventional concrete aggregate specifications.

2. The mixing water requirement of concrete for a given slump became somewhat greater as the amount of crushed sand substituted for natural sand in the fine aggregate became greater. For each one-third substitution, the water requirement was increased approximately ½ gal. per cu. yd.

3. Compressive strength of concrete was slightly reduced as the percentage of crushed sand was increased. For the four classes of concrete studied, the reduction averaged approximately 1 percent for each 10 percent replacement of natural sand with crushed sand. This trend was not discernible in flexural strength data.

4. Reductions in compressive strength resulting from use of the crushed sand may be attributed largely to increases in water requirements of the concrete. The reductions were of approximately the magnitude which would be expected to result from the increase in water-cement ratio caused by use of the crushed sand.

5. Use of the crushed sand had no significant effect on the resistance of the concrete to freezing and thawing. All non-air-entraining concrete failed quite rapidly (in 122 cycles or less) and there was no consistent relationship between the rate of failure and the amount of crushed sand. All air-entraining concrete produced excellent freezing and thawing resistance regardless of the composition of the fine aggregate. There was no discernible damage to the concrete after more than 700 cycles, when the tests were discontinued.

Slag Plant Expansion

WOODSTOCK SLAG CORP., Birmingham, Ala., has announced an expansion of its operating facilities. The company produces an expanded lightweight slag, tradenamed "Expanslag."

Thermoid Conveyor Belting cuts handling costs in quarries

Thermoid Industrial Rubber Products — Quality — Service

There's a Thermoid Conveyor Belt designed to lower your handling costs on every quarry job. Here are three examples: **HT** For extremely abrasive materials such as granite, trap rock, flint rock, quartz ore; **A** For slag, lime rock, crushed stone and other highly abrasive materials; **C** For moderate abrasives such as sand, loam, soda, gravel.

Thermoid's exclusive impregnation process welds carcass and cover into an exceptionally strong, durable belt. Finest quality reinforcement and specially compounded rubber stocks assure long life . . . lower your handling costs per ton. Call your Thermoid Distributor, or write direct for Catalog #3687.

Conveyor & Elevator Belting • Transmission Belting
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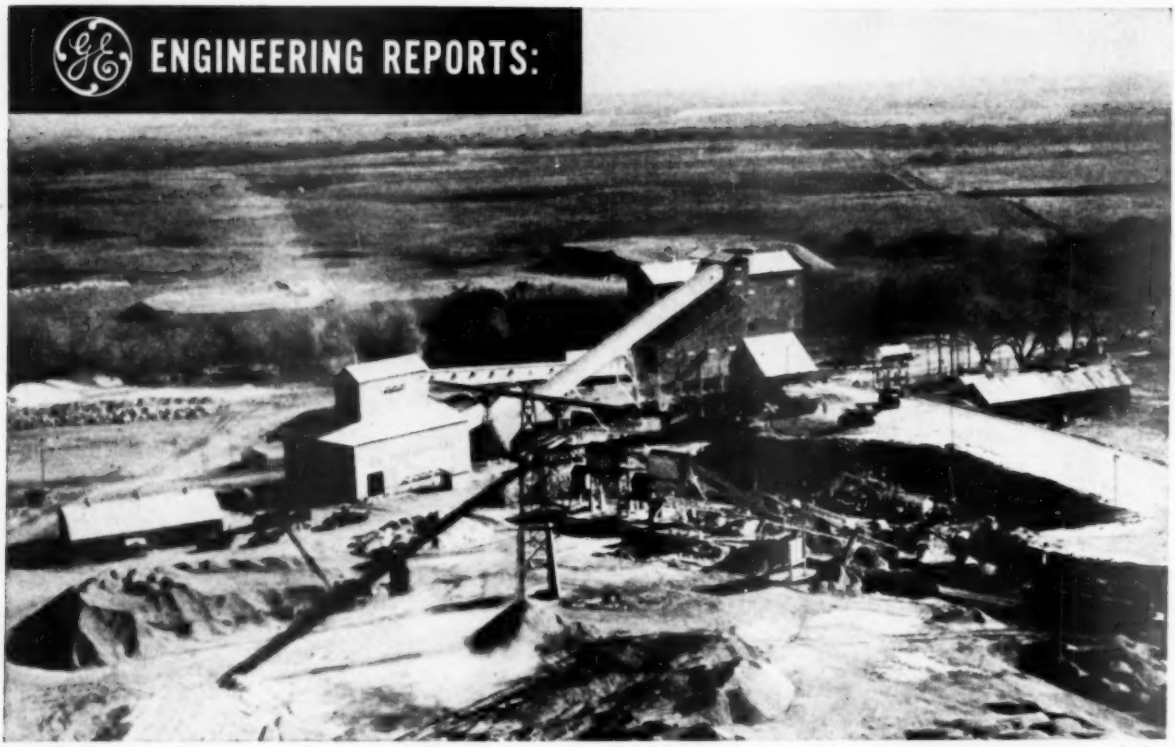
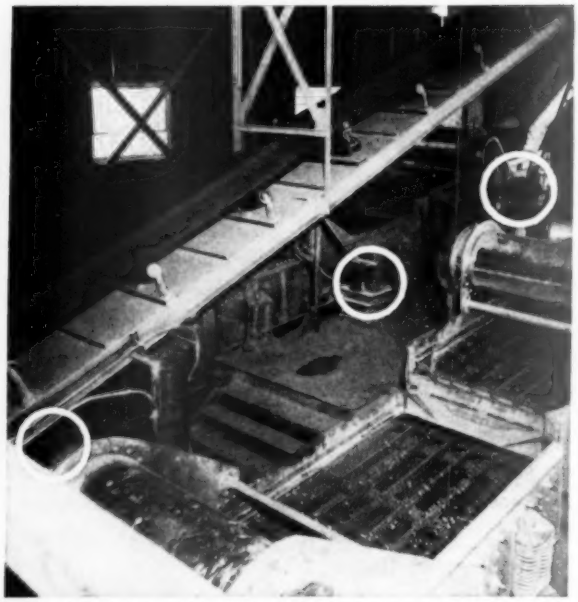


ENTIRE PLANT of Dolese Bros. Co. is operated with General Electric motors and control, co-ordinated to meet diverse, yet exacting specifications. Shown here are earthen ramp and the crushing building (right) and stockpiling facilities (left).

New 750-t.p.h. crushed-stone plant

1 STONE COMES TO THIS CRUSHER on conveyor powered by G-E 100-hp a-c motor (not shown). Solenoid trip (top left) controls feed automatically. Crushed stone is then removed by conveyor driven by G-E motor at lower right.

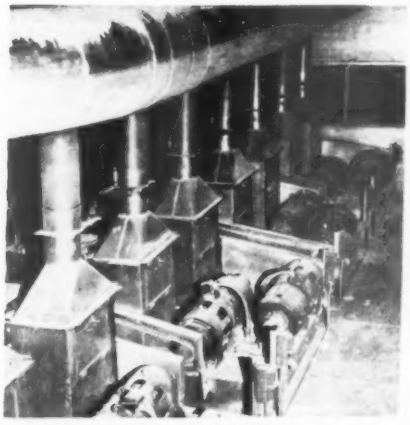


2 SCREENING IS CONTINUOUS to maintain high production rate. All screens are operated by G-E Tri-Clad* totally enclosed motors (circled), which keep production going under all operating conditions.

*Reg. trade-mark of General Electric Company

MASTER CONTROLS for whole operation are easily handled by one man. Desk-type benchboard controls screening process; vertical panel controls all blending and loading. All controls are located in air-conditioned central control room.

accurately controlled by one man



3 FEEDERS SUPPLY BLENDING process by belts driven by this battery of General Electric d-c gear-motors, powered and controlled by G-E speed-variators.

Dolese Bros. Co. plant completely electrified with G-E drives for peak output

One of the most modern crushed-stone plants in the world, Dolese Bros. Co. of Richard Spur, Okla., relies on an electrically co-ordinated plant-flow system for balanced production at top capacity of 750 t.p.h. Nerve center for this fast-moving operation is General Electric centralized control, which accurately integrates all production operations with the Hewitt-Robins materials-handling system.

Each process is pre-set, and controlled with finger-tip sensitivity from the central control room to meet any one of an almost infinite variety of stone-size combinations. Money-saving, production-boosting G-E motors and generated voltage control are used for the entire system. Result is extra flexibility and smooth flow of production through the plant.

FOR HIGHER OUTPUT, MODERNIZE ELECTRICALLY. To eliminate bottlenecks and increase production in *your* plant, G-E application engineers are ready to work with you and your equipment manufacturers. Contact your nearest G-E Apparatus Sales representative today. General Electric Company, Schenectady 5, N. Y. 658-12

Engineered Electrical Systems for the Rock Products Industry

GENERAL ELECTRIC

Production of Lightweight Aggregates

Fastest Growing Non-Metallic Industry

By H. G. IVERSON*

ONE OF THE FASTEST GROWING nonmetallic industries in the United States is the production of lightweight aggregate from clays and shales. Most of the 41 plants in operation or under construction have been built in the last 10 years. A feature of this industry is that it is widespread; plants are in operation or being planned in 20 states, as shown in the following table.

State	Plants	State	Plants
California	3	New York	2
Colorado	1	North Carolina	2
Georgia	1	North Dakota	1
Illinois	5	Ohio	3
Iowa	1	Oregon	1
Kansas	2	Pennsylvania	1
Kentucky	1	South Dakota	1
Louisiana	2	Tennessee	3
Michigan	1	Texas	7
Missouri	1	Virginia	2
Total plants			41

The rapid growth of the industry, and the requests for information by engineers and architects led to the founding in May 1952 of a nationwide organization, the Expanded Shale Institute. The Institute correlates research by other agencies, conducts original research, and disseminates technical and general information concerning the industry among architects, engineers, universities, and the general public.

Lightweight aggregate is differentiated in this discussion from ultralightweight aggregate, which includes materials weighing about 12 lb. or less per cu. ft. This category includes exfoliated vermiculite, expanded perlite and pumicite. Although lightweight aggregate is also a cellular material, it is heavier than the ultralightweight aggregate, but considerably lighter than sand and gravel aggregate. For example, the weight of a standard 8- x 8- x 16-in. concrete block made with lightweight aggregate is about 21 to 28 lb., whereas the same size block made of sand and gravel aggregate will weigh about 42 to 46 lb.

In addition to its light weight, concrete made from lightweight aggregate has other desirable qualities, including high strength, low absorption, good insulation, low expansion or shrinkage, and other features. The degree of these qualities possessed by any lightweight concrete, of course, depends on the type and size of aggregate used and on other factors involved in making concrete.

*U. S. Bureau of Mines, Region V.

Uses of Lightweight Concrete

Due to one or more of its properties, this type of concrete has a wide variety of uses. These include lightweight concrete masonry units; tilt-up wall panels; multiple-story buildings; precast roof and floor slabs; piers and superstructures of bridges; bridge decks; precast bridge members; culverts; jet-plane runways; burial vaults; stucco aggregate; and other products.

Probably the most important use of lightweight aggregate, tonnage wise, is in the manufacture of lightweight-concrete masonry units. Although much of the expansion in the industry has occurred since 1947, statistics for that year, the latest available, give some indication of the importance of the industry. Of the 1042 million concrete masonry units manufactured, 47 percent were lightweight units.

Sources of Raw Materials

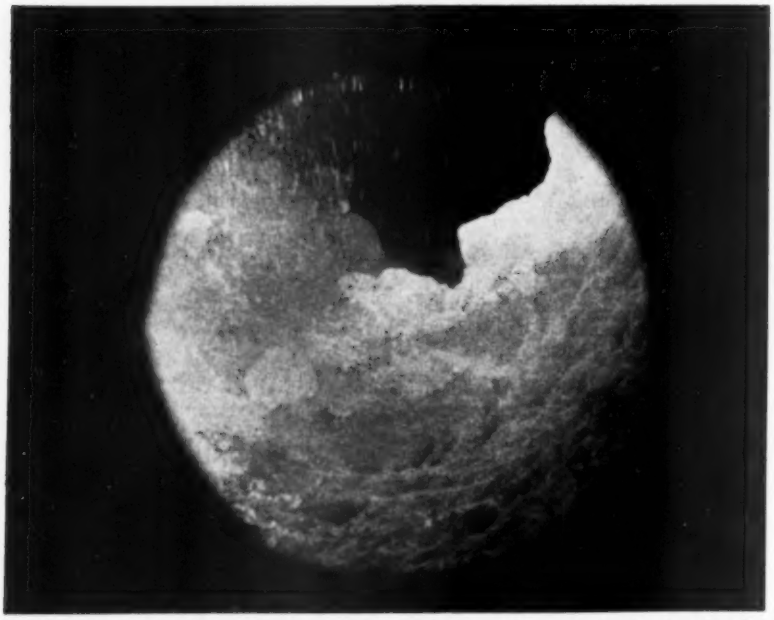
Lightweight aggregates may be produced from a variety of materials in addition to shales, clays and slates. Possible sources of raw materials may be classified as natural, byproduct, or manufactured aggregates. Natural aggregates include clinker, which is an expanded material formed by the burning of coal beds, and scoria, a volcanic product. Byproduct aggregates include cinders, a residue from high-temperature combustion of coal in industrial plants; sintered fly ash; and artificially expanded blast-furnace slags. Manufactured aggregates include artificially expanded clays, shales and slates. Manufacture of lightweight aggregate from the latter materials has achieved outstanding prominence in the last decade.

"Bloating" Through Admixtures

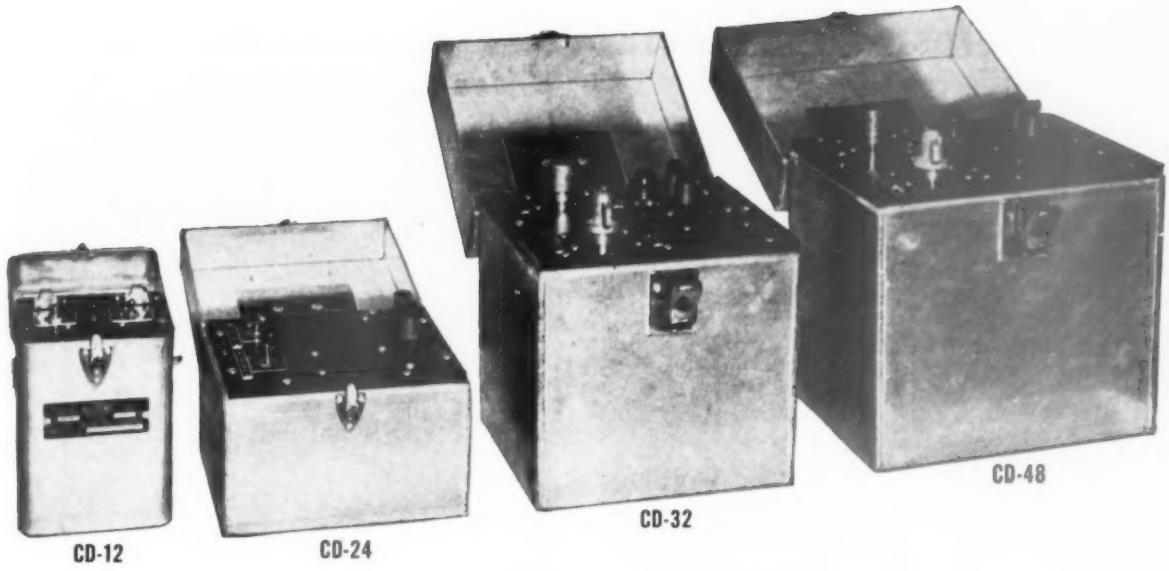
In commercial bloating of shales, clays and slates, the materials are usually heated to from 1000 deg. to 1200 deg. C. or higher. However, all clays, shales and slates do not bloat upon heating to elevated temperatures. Some are too refractory, and others melt or slag, forming a dense, glassy mass, over a very narrow temperature range. Many non-bloating clays and shales can be converted to bloaters by the addition of proper admixtures and intimately mixing these with the raw materials before firing.

The bloating property of a material does not depend on the basic type of clay minerals present, as equally good bloating clays may be found among both kaolinite and montmorillonite-beidellite-type clays. Clays and shales generally used for making bloated products are similar in many respects to those from which brick, tile, sewer pipe and other structural clay products are manufactured. They are the common or low-grade clays,

(Continued on page 138)



At the plant of Dallas Lightweight Aggregate Co., subsidiary of Texas Industries, Inc., Haydite is made by expanding shale at temperatures in excess of 2000 deg. F. Seen from a peephole at the firing end of kiln, the shale is at the point of incipient fusion and is about to drop into the cooling pit



For more powerful, more dependable, safer electric blasting,

use Du Pont CD Blasting Machines

You can fire any conceivable type of blast . . . large or small . . . on the surface or underground . . . with maximum safety, efficiency and economy with Du Pont CD (Condenser Discharge) Blasting Machines—newest development of Du Pont Explosives Research.

Du Pont CD Blasting Machines offer a simple and satisfactory method of firing either primary or secondary blasts. These four lightweight, portable power sources have capacities ranging from 20 holes in straight series to 1200 holes in parallel series. Safety is greatly increased with Condenser Discharge Machines because power *cannot* reach blasting circuits except by the deliberate action of the operator.

These machines eliminate maintenance of permanent firing lines and dependence on motor generators. They have no moving parts, require no physical effort as with mechanical-type machines, and are extremely easy to operate. Long-lasting radio-type B batteries charge the condensers, light up a pilot lamp when they're fully charged. Shots are fired only by turning on a firing switch. Terminals are dead until the instant of firing.

It's easy to fire large or small shots with maximum safety using Du Pont CD Blasting Machines. Ask the Du Pont Explosives representative in your area for complete information about them. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

Characteristics of Condenser Discharge Blasting Machines

Model	Rated Voltage	Capacity with Leading Lines Not Exceeding 3.0 Ohms Resistance			
		Straight Series		Straight Parallel	Parallel Series
		Primary	Secondary		
CD-12 Weight 4 lb Width 4 in Length 5¼ in Height 7 in	120	20	30	NR*	NR*
CD-24 Weight 12 lb Width 7¾ in Length 8¼ in Height 6½ in	240	50	75	NR*	240 (6 series of 40 each) (8 series of 30 each)
CD-32 Weight 22 lb Width 9½ in Length 9½ in Height 10½ in	320	50	125	30	480 (10 series of 48 each) (12 series of 40 each)
CD-48 Weight 27 lb Width 9½ in Length 11 in Height 12¼ in	480	50	200	60	1,200 (24 series of 50 each) (30 series of 40 each)

*NR means not recommended for the purpose.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

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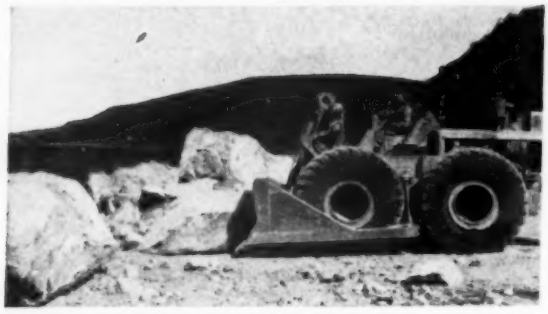
BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Pictures of the month . . . by LeTourneau-Westinghouse



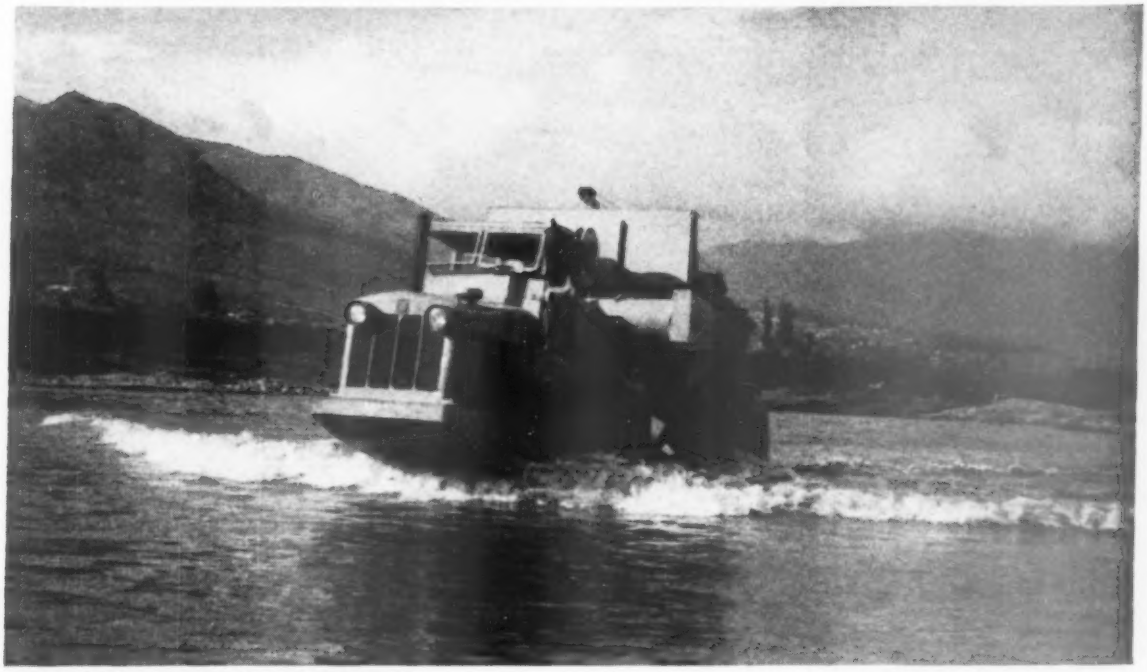
HAUL 30 TONS OF ROCK — 90 miles south of San Diego, Calif, at Ensenada, Mexico, 6 rear-dump Tournarockers and 1 Tournatractor are extending this 130-ft-wide breakwater 5000 ft into more than 50 ft of water. Hauling over existing fill, Tournarockers make one-mile cycles with 12 pay yds every 7.7 minutes. Some rocks hauled measure 5 x 6 x 12 ft and weigh over 30 tons. Tournatractor (below) levels fill and maintains haul road. Say Equipment Owners Clark & Mansilla, "It's amazing how well these machines stand up under the rough conditions we are working in."

MOVES SAND THAT OTHERS CAN'T —Finley P. Smith, alternately stripping his Florida stone quarry and leveling beach property, uses 5 D Tournapulls and 3 Tournatractors for all work. He gives as typical output for each Tournatractor-loaded 7-yd "D" . . . 10 pay yds of sand hourly on 600 to 1000 ft hauls, 120 pay yds on 400 ft hauls. Says Smith, "No other scraper can move this beach sand. They're all too heavy to get traction in the poor footing." When stripping rock mixed with sand from the quarry, each "D" moves 80 to 90 yds hourly over 300-ft hauls.

STRIPS 200 FT OF SHALE to reach 30 ft seam of coal. This open-pit provides the country of Malaya with its only source of coal. The miners are working 18 LeTourneau haulers 21 hours a day, 7 days a week. Each hauls 18 tons of overburden per load. They averaged 15 mph over narrow, hilly, winding haul roads. Units on one-mile cycles deliver 9 to 10 loads per 50-minute hour.

(Advertisement)

. . . with performance reports from around the country



DRIVES THROUGH WATER — Tournarocker's ability to travel through water without damage is an important advantage on many mine and quarry installations. This picture illustrates how Tournarocker hauls gravel and sand from river-bed to the new public stadium in Medellin, Colombia. River bottom is rough and full of rocks and holes. Water depths range from 20 to 30 inches, but Tournarocker disc-type air brakes and electric control system have not been harmed, or even affected, in a year of this work. Dragline loading and haul underwater were necessary because the river bed was only nearby source of material for concrete.

DOUBLE-DUTY — Vernie Jarl, Gresham, Oregon, by interchanging 18-ton Scraper and Rear-Dump trailing units, works his 4 C Tournapull prime-movers efficiently on both rock and dirt jobs. About Scrapers, Owner Jarl says, "They move dirt cheaper than tractors on any length haul." About Rear-Dumps, his Superintendent, Art Bolder, says, "They're the only rigs that work efficiently in the tight quarters we have here."

220 TONS HOURLY — A large Southern utility reclaims 220 tons (298 yds) of stockpiled coal per 50-min hr with their Tournatractor-Carryall team. Rig works 1000 ft "figure-8" cycle from edges of pile to centrally-located conveyor . . . makes 29 trips hourly. Operator says, "Tournatractor handles coal faster than anything I've seen in 9 years." For details on tools shown here, write LeTourneau-Westinghouse Company, Peoria, Ill.

Tournapull, Carryall, Tournarocker—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark Pic-610-M

(Advertisement)

Fig. 1: Set-up for building up kiln support rolls by hidden arc welding. To the left may be seen the 600-volt d-c welder, and to the right, the automatic wire feed unit

WELD-SURFACING
of Cement Mill Equipment

By W. M. DAVIS*

WELD-SURFACING of kiln support rolls was recently started by the Louisville Cement Corp., Speed, Ind., which has cut down repair costs by 50 percent. Previously the rolls were removed from service, and the entire roll face machined, then shipped 300 miles to have the steel band shrunk on and a new band machined. The repair cost $2000. Now the roll is placed in a simple rotating fixture right in the plant, and filler wire is applied with manual Lincolnweld equipment to rebuild the roll to size at a cost of about $1000.

The first kiln roll resurfaced weighed approximately 9 tons with a diameter of 4 ft. and a 24-in. face. To build up such a roll with a 3-in. layer (increasing the diameter by 6 in.) means a deposit of approximately 6 cu. ft. of weld metal.

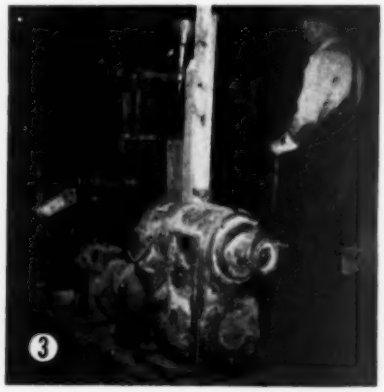
Set up Rotating Fixture

To do the job the company made a rotating fixture in its own shop from discarded structural members and plate. The roll shaft was positioned on four large ball bearings, and rotated by a chain and sprocket arrangement. The sprocket was bolted to the shaft. The welding gun of the semi-automatic welding equipment was mounted in a holder made from plywood hinged so the gun could be swung away from the work to break the arc. The gun mounting is adjustable with a thread and screw device across the top of the fixture so that after each rotation of the roll, the gun can be indexed for the next bead without interrupting the arc. The roll turns at 24 in. per minute, the mild steel filler wire is applied at 450 to 475 amp. at a rate of 20 lb. per hour.

Exclusive of the fixture cost, the total cost of weld-surfacing the 9-ton roll was approximately $1000; $600 for materials (flux and wire) and $400 for labor (estimated on the basis of depositing 120 lb. per 8-hr. day, 25 days or 200 hr. to deposit 3000 lb. at $2 per hr. for the operator.) This is a saving of 50 percent over the previous steel banding method of repair.

This result was obtained although none of the employes under the direction of Jesse Himebaugh, shop foreman, and Robert Krajnak, shop superintendent, had had any experience with submerged arc welding.

*Welding engineer, The Lincoln Electric Co.



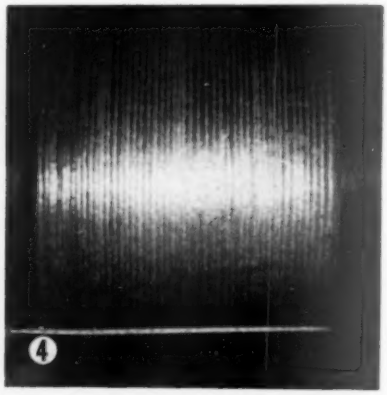


Fig. 2: Close-up of welding gun, through which wire and flux are fed to the work, mounted on top of fixture. Hand screws can be adjusted for horizontal movement of the gun according to the progress of the work. Ground connection rides against end of shaft. Screw against shaft keeps roll from "riding" on bearings. Fig. 3: Drive mechanism for turning roll. Fig. 4: Finished surface before machining. Fig. 5: A 3-in. thick surface on roller means a deposit of 3000 lb. of metal. Fig. 6: Appearance after machining. Fig. 7: Kiln roller back in service

Refractory test furnace shown above is the only one of its kind in the industry. Temperatures up to 3180° F. check Permanente Periclase-Chrome brick for deflection, resistance to thermal shock and chemical attack—only three of 86 rigid tests for quality!

86 RIGID TESTS ASSURE LONGER HOT ZONE LIFE

WITH PERMANENTE PERICLASE-CHROME BRICK!

IF YOU are looking for ways to get longer hot zone lining life from your rotary cement kiln, take a look at this fact:

Permanente Periclase-Chrome brick must meet at least 86 tests for quality and performance—far more than required for any other brick available today!

The superior quality of Permanente Periclase-Chrome brick is increasing clinker production in kilns all over the country. One large cement producer reports:

"With the whole length of the burning zone lined with Permanente brick . . . the lining will last 9 to 12 months—as much as 4 times longer than with the other brick used."

If an appraisal of your kiln performance would be helpful, our engineers will be glad to work with you.

SEND FOR BOOKLET giving installation procedures and for descriptive literature. Standard brick shapes available, both burned and chemically bonded. Installation service at no extra cost. Call or write principal sales offices: *Chemical Division*, Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, California; First National Tower, Akron 8, Ohio.

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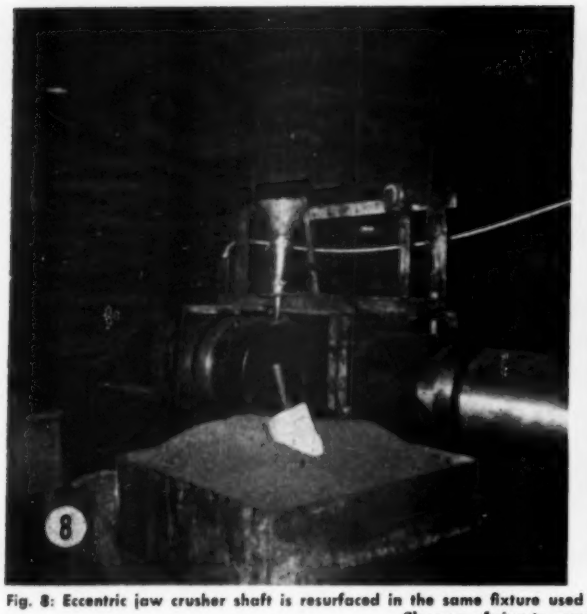
Basic Refractory Bricks and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase



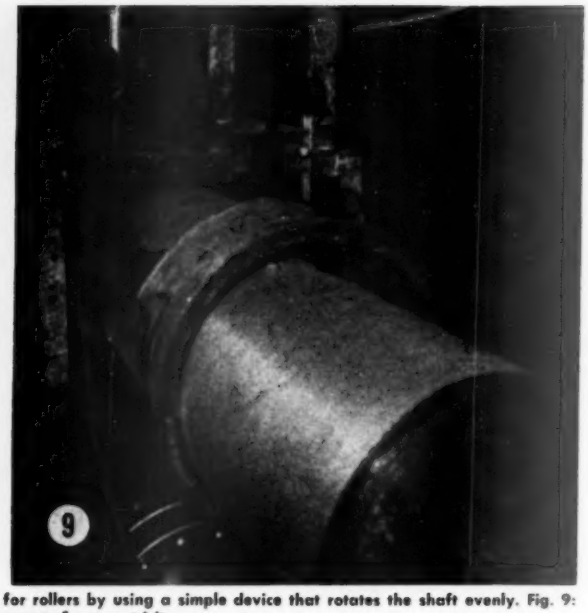


Fig. 8: Eccentric jaw crusher shaft is resurfaced in the same fixture used for rollers by using a simple device that rotates the shaft evenly. Fig. 9: Close-up of ring to compensate for eccentricity

On the basis of the experiences derived in welding the 9-ton roll, the Louisville Cement Corp is now also weld-surfacing smaller kiln rolls of various sizes, applying anywhere from 180 to 750 lb. of weld metal.

Jaw Crusher Repair

Lately, one of the eccentric shafts of a jaw crusher has been repaired at a total cost of $920. The replacement cost of the shaft is more than $3000. The technical problems here were more intricate as the 10 ft. 7 in. long shaft, weighing 4½ tons, had diameters of 12 in., 14 in. and 16 in., with the 16 in. portion of the shaft being 1-in. eccentric. Means, therefore, had to be provided to rotate the shaft evenly for this portion of the weld-surfacing. The 14-in. diameter area was to be built up by ½ in., the 16-in. area by 1 in. It was done by rolling two ¾- x 4-in. bars to a 16-in. outside diameter. Two pieces of ⅛- x 1-in. were then rolled to a 17-in. diameter, and then tack welded to the side of each of the two rolls, forming a flange. Each of the rolls was then drilled and tapped for seven large set screws. These rings were properly located over each end of the shaft on the 14-in. diameter section, and were placed to ride on the fixture bearings. The set screws, placed on the inside face of the rings, were then backed out so that they tightened on the shaft. The rings had been positioned so that their flanges rested against the outside edges of the fixture bearings which prevented the shaft from "walking" while being rotated.

After this portion of the facing was completed, the rings were removed, and the 14-in. diameter section of the shaft was built up.

The material used was $\frac{5}{64}$-in. L-60 wire with 650 lb. of No. 840 agglomerated flux. This was applied at 375 amp. straight polarity at approximately 20 in. per minute or 20 lb. per hr. The welding time was 39 hr. and machining time 50 hr. The shaft was put back in service, showing no signs of distortion.

Canadian Sand and Gravel

COMMERCIAL SAND AND GRAVEL PRODUCTION in Canada in 1952 amounted to 102,895,545 tons, valued at $51,339,043, compared with 92,972,821 tons, valued at $44,627,559 in 1951. The 1952 production in Ontario, amounting to 43,423,737 tons, was 11 percent higher than in 1951. Quebec production of 32,060,910 tons, showed a 2.4 percent increase over the preceding year. There were 14,137,868 tons of sand and gravel washed and screened in 1952, compared with 12,849,635 tons in 1951. The bank, or pit-run, grades amounted to 88,757,667 tons in 1952, compared with 80,123,186 tons the previous year.

Israel Phosphate

A SURVEY of a 10,000-acre area in the Negev region of Israel reportedly has revealed the existance of at least 50,000,000 tons of phosphate rock, with evidence that the deposit might reach 100,000,000 tons. Although the rock contains only about 28 percent pure phosphate, compared with the world average of 33 percent, a calcining plant is being planned to obtain phosphate of a higher degree of purity.

The Negev region, half of Israel's territory, was formerly known as the "dead" region, but with a complex of new plants designed to exploit the mineral resources, Negev is expected to become the more important half of the country. A 3½-year construction program, of which about half will be financed in foreign currency, will include facilities to produce about 600,000 tons of calcinated phosphate rock annually, 160,000 tons of sulphuric acid, and large quantities of phosphoric acid, soda ash, and triple superphosphate, expected to yield about $14,000,000 net profit yearly. A 10-year plan for a second stage of development is also being planned and envisages a $50,000,000 annual profit.

The Potash Works at Sidom, on the Dead Sea, reached an output of about 200 tons daily by the end of 1953, and with improvements and installations now underway, production is expected to reach a rate of about 135,000 tons annually by July, 1954.

Haydite Freight Rate

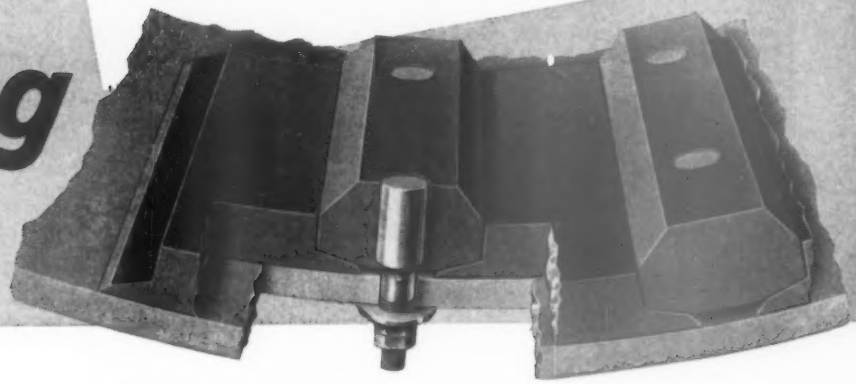
THE STATE OF OKLAHOMA has established a new freight rate for the state's new Haydite industry. The material, produced by Oklahoma Lightweight Aggregate Co., Choctaw, Okla., had previously been shipped under a "class rate," as there had been no established rate until the commission order was issued. The new rate will be about 25 percent above sand and gravel rates, but much lower than the "class rate" formerly paid. Railroads at first had indicated they would ask for a rehearing on the order, but have dropped their plans.

Purchases Gravel Property

A. TEICHERT AND SON, INC., Sacramento, Calif., has purchased 70 acres of gravel property along the Mokelumne River bed near Clements, Calif. Former owner was Austin Mahoney. The property, which was formerly dredged for gold by Gold Hill Dredging Co., is said to be a rich source of gravel for construction work.

Cut grinding costs

- U·S·S Lorain Rolled Plate Linings are in easy-to-handle sections, accurate sizes to permit quicker installation.
- Lift bars are designed for correct cascade action . . . height of lift varies according to conditions.
- Plates can be heat-treated to compensate for wear.
- Correct sizes make tighter joints—eliminate shell wash.
- Bolt supports located near the bottom of the bar . . . last for life of the lining.



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You can do more and better grinding, for less money, with U·S·S Lorain Rolled Plate Linings. The output of your mill increases when the usable diameter increases, and this is just what happens when rugged Lorain *rolled steel* plates are used instead of ordinary castings. Lorain Liners can be much thinner due to their superior strength. Their lighter weight simplifies handling.

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Lorain Liners are so durable that they remain serviceable until they're almost paper thin. You benefit from the use of the entire plate . . . there is less waste, longer wear. Mill downtime will be reduced and so will your upkeep costs.

The accurate size of U·S·S Lorain Rolled Plate Linings assures tight fit between the ends of the plates and between plates and lift bars, eliminating shell wash.

U·S·S Lorain Rolled Plate Linings are available—in the diameter, length and thickness best suited to your operating conditions—through leading mill manufacturers whose names will be furnished upon request.

U·S·S GRINDING BALLS are carefully made of special composition steel to take long, rough wear evenly. Samples from each production lot are thoroughly tested to make sure of surface hardness and maximum hardness penetration. They come in eleven sizes from $\frac{3}{4}$" to 5". For further information just return the coupon below.

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UNITED STATES STEEL

Calcination and Hydration Research

German research work develops the effect of calcining temperature and time on the reactivity of resulting lime

By VICTOR J. AZBE*

ONE OF THE MOST INTERESTING and lucid articles on lime I have ever had the pleasure of studying appeared recently in the rather splendid and highly to be recommended German publication, "Zement-Kalk-&-Gips." Its author was Dr. J. Wuhrer of the Rheinische Kalksteinwerke, Wulfrath, one of the world's largest lime producers whose general director was a recent American visitor, Paul Flachsenberg.

The article is based on extensive calcination and hydration research. It is quite lengthy, comprising several chapters, of which I will deal only with the first, that of calcination. The author of the article not only develops and illustrates the effect of calcining temperature and time on the reactivity of the resulting lime, but what is more important, presents the reasons for it.

Dr. Wuhrer's tests were very carefully conducted and were repeated for checking, so the results must be assumed to be reliable. However, they would apply only to the stone he used, for any other stone the results would be somewhat different but the general tendency would be of the same pattern.

The stone used had a specific gravity of between 2.7 and 2.75. It was thus quite dense, close to calcite, and of very good quality as the following analysis indicates:

Insoluble and SiO_2	.24 percent
Al_2O_3	.23 percent
Fe_2O_3	.09 percent
CaO	55.53 percent
MgO	.30 percent
SO_3	Trace
CO_2	43.44 percent

Two of Dr. Wuhrer's illustrations, supplemented with a Fahrenheit temperature scale, are shown. Fig. 1 features the relationship of temperature and time to the specific weight of the resulting lime. The dots represent the various tests, and it is interesting to note how closely they follow their respective curves. This in itself inspires confidence, since the great diversity often encountered in such tests would tend to my mind to indicate imperfect testing.

Lime calcined at the very lowest temperature will occupy the initial space of the stone as lime. It may occupy even more than the initial space, since at the very softest burn it is in a slightly expanded state which both Professor Murray as well as our laboratory discovered independently. The apparent volume of the lime, however, will be mostly space because the specific gravity of calcium oxide is 3.3 while the apparent gravity of the lime is 1.57 or less. This is now fairly well known; that is, lime shrinks, coarsens in structure, and de-activates, but no one as yet has clarified the matter as clearly as Dr. Wuhrer.

He points out that the loosest packing of spherical particles would result in a void space of 47.6 percent, while that of soft burned lime, even from this dense stone would be 52.5 percent thus indicating presence of cavities. His conclusions, however, are not based entirely on gravity determinations; in addition the calcined specimens were very carefully crushed, not ground, and the constituent particles examined and measured with the aid of both special optical and electronic microscopes.

These revealed that in the case of soft burned lime the individual particles had a point contact, as a mass of very loosely packed spheres would have, which on increased heating, would change to a surface contact. The initially minute particles had a tendency to grow at the expense of the adjacent particles, getting ever larger and at the same time ever closer which continued until the lime assumed the so-called dead burned state of a sinter.

While initially the pores were large and connected, gradually they became smaller and some were closed off. Since it is only the open pores that allow access of water, closed pores inhibit the reaction within their surrounding region unless disintegration of the entire mass during the process of hydration establishes an avenue of access.

Dr. Wuhrer's method of determining open and closed pores was to first establish the specific gravity of the paraffin covered lime, then on burning off the paraffin determine the volume increase by immersion in alcohol.

Fig. 1 presents the relation of calcining temperature and time to the resultant specific weight of the lime or what may also be called apparent specific gravity, as we know that the CaO therein has to possess a gravity of 3.3. It will be noted that lime calcined and retained at a temperature of 800 deg. C. (1472 deg. F.) increased only very slightly in its density, even on very prolonged heating time. Dr. Wuhrer calls this the "Theoretical Soft Burn."

It is not exactly "theoretical" because we found that the minimum of calcination temperature at minimum

*President, Azbe Corp., St. Louis, Mo.

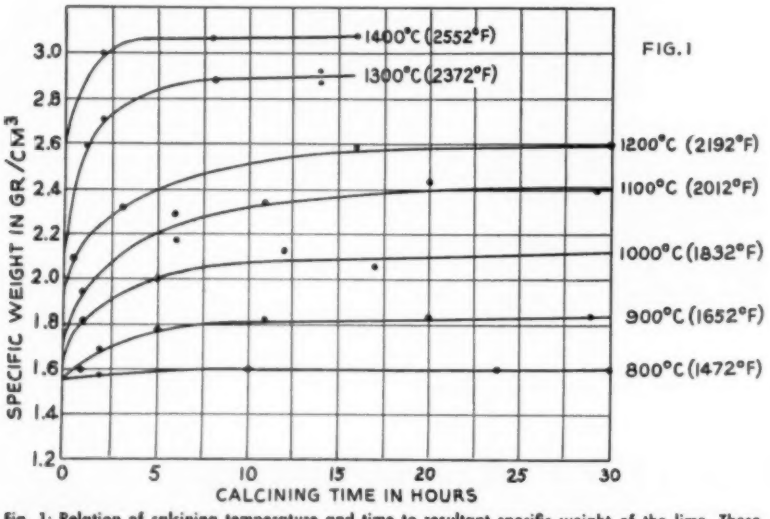

Fig. 1: Relation of calcining temperature and time to resultant specific weight of the lime. These curves apply for one particular lime, dense and of good quality; for others the position of the respective temperature curves will be different but their general pattern will likely be the same

GM DIESEL
CASE HISTORY No. 639-51

USER: Geo. M. Brewster & Son, Inc., Bogota, N. J.

INSTALLATION: Four GM Diesel-powered Ingersoll-Rand Gyro-Flo 600 compressors supplying air for 9 I-R 71 wagon drills.

PERFORMANCE: "Completely satisfactory," says operator Tom Malone. Units shown were delivering air to the tools through 1200 to 1600 feet of line--maintaining steady pressure of 100 to 110 psi.

It pays to STANDARDIZE on

GM
GENERAL MOTORS
DIESEL POWER

2400 CUBIC FEET OF AIR PER MINUTE ON NEW YORK THRUWAY ROCK CUT

Geo. M. Brewster & Son now operate a total of 18 General Motors Diesel-powered Gyro-Flo compressors, including this battery of four capable of supplying 2400 cubic feet of air per minute for rock drills on a section of the New York Thruway, near Kingston.

These modern rotary compressors take full advantage of GM Diesel's smoother-running 2-cycle operation to maintain a steady flow of nonpulsating air at 100 psi or better. And compactness of the GM 2-cycle design makes these units smaller and lighter for quick, easy movement from job to job.

This inherent engine design superiority—plus interchangeability of lower-cost parts, readily available through a world-wide GM Diesel service organization—explains why GM Diesel power is a favorite of contractors on so many jobs. Next time you order equipment, it will pay you to specify GM Diesel. Available as original or replacement power in more than 750 different models of equipment. Write us for complete list.

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GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

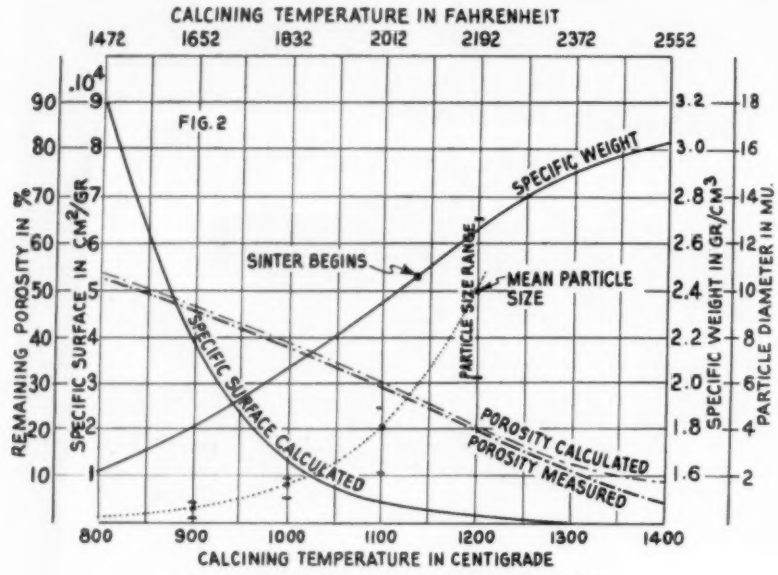

Fig. 2: Specific weight-porosity and internal surface of lime

of CO_2 concentration is somewhere around 650 deg. C. at which, it may be assumed, as judged by Dr. Wuhrer's curves, that at this temperature the lime would retain indefinitely its initial volume.

However, practically we can go along with Dr. Wuhrer and assume the 800 deg. C. lime as the "softest burn." It would be produced at low rates of calcination and at an interfacial CO_2 concentration of about 30 percent.

Dr. Wuhrer's curves show that, regardless of temperature, all specimens initially had the specific weight of the "softest burn," but that they departed therefrom at an ever increasing rate, and at the highest temperature very likely as a flash.

What is particularly interesting is that for each temperature there was a seeming limit to specific weight increase. Also what is very interesting is the time required to attain the maximum of density. Up to and including 1200 deg., the time was long; at 1300 deg., however, not only the increment of raise in density for the 100 deg. was much greater, the time required to reach the maximum was much shorter. Dr. Wuhrer ascribes this to sintering, the assumption by lime of a semi-plastic state which allows a faster consolidation than the initial dry state. Really there is a very pronounced change between lime of 1200 deg. C. and 1300 deg. C., a change fully explained by his microscopic studies.

In the measurement of the particles, projected by the optical microscope, the use of monochromatic light of a short .43 micron wave length and an aperture of 1.45 made it possible to measure individual particles as small as .3 micron diameter. However, for checking whenever particles were of less than half micron size, an electronic microscope was used.

It was found that particles of the 800 deg. C. lime had a diameter of .3 microns; that all were of about this size, even on 10-hr. subjection to temperature, which explains why this lime retained virtually the initial specific weight. I may inject at this point that 85000 of these .3 micron particles would be required to line up to one inch.

The unit particles of 900 deg. C. lime also had the initial .3 micron size, but after 10 hr. of heating increased to .5-.7, which explains the 900 deg. curve, as similar growth and consolidation explains the 1000 and 1100-deg. curves.

At 1200 deg. C. there was a change, on 1½ hr. of heating time, to a particle size range from 3 to 5 microns; when this was extended to 10 hr., 6 to 13 microns. Their packing also changed; it ceased to be a point contact and became more of a surface contact. However, the inter-connecting channels and cavities were still readily recognizable.

After 12 hr. at 1200 deg. C. there was a further material change; the lime could not be as readily crushed, the surfaces of the particles were smoother and denser. There was a non-uniformity in both size and shape, the corners and edges were sharp, much like ground glass.

Dr. Wuhrer points out that the temperature at which the initial sintering begins will be different for different lime, but to know what the division line is, and to avoid it, is very important except where sintered lime is desired. He states that there was a sharp demarcation and less of a difference between lime of 1.6 and 2.4 specific weight than between lime of 2.4 and 2.5.

With Fig. 2, Dr. Wuhrer presents a very interesting graphical summarization. It is based on test data of Fig. 1, microscopic measurements and calculations. The time of heating is here not taken directly in consideration. He states, as an example, that lime of a specific weight of 2.3 will be the same whether it was subjected to 1100 deg. C. for 10 hr. or 1200 deg. C. for only 4 hr.

On the specific weight curve at 2.45 is located the microscopically determined initial sintering point. At this stage the sintering is very slow, but the temperature of 1150 deg. C. (2102 deg. F.) is low, while the purity of lime is high. The two porosity curves, shown separately, should really superimpose until the sinter point when they very gradually begin to depart from each other, the difference being indicative of closed off pores.

The slant of the specific weight curve shows that a sinter of the CaO, 3.3 gravity, could be obtained at only the very highest temperature as almost a fluid state would be required to eliminate the occluded pore volume.

One of the curves shows the average particle diameter, by lines above and below the particle size range. It reveals the very rapid coarsening of the structure and increase of size range.

Very interesting is the specific surface which was calculated from the measured particle size. The 800 deg. C. lime presented a surface of 9 sq. m. per gram which is just about one acre per pound. This surface drops off very fast, and at the point where the initial sinter formation begins, it is only 3 percent of this and at 1300 deg. F., near to nothing.

This explains the difference in reactivity of the lime; the virtually explosive "softest burn" and the truly "dead" fully consolidated sinter. As Dr. Wuhrer states it is not chemical but purely a physical characteristic, a matter of surface available to the reaction.

Through milling of harder burned lime, surface and reactivity may be regained, and the product may be made somewhat equal to some softer burned lime. However, the very most active state of the latter could hardly be attained. I believe also that the "softest burn" is a different sort of lime to which the relatively broad X-ray diffraction lines compared to the narrow and speckled of the hard burned would be revealed.

Specifically all of the foregoing applies only to lime specimens that could be uniformly heated, not to larger sizes. Any large lump will consist of a range of products which basically will depend on temperature-time gradient through the cross section, a sort

(Continued on page 140)

No. 1 of a series

How Bemis makes GOOD multiwall bags for you

A.R. Ewing, director of the Bemis Paper Control Laboratory, has twenty-nine years' experience in this field. He is shown operating the laboratory's electro-hydraulic tensile tester, one of the many precision devices that make the Bemis laboratory probably the most complete in the country devoted to bag papers.

Use good paper... test it... prove it!

Bemis sets high standards for the various papers used in making Bemis Multiwall Bags. And we are able to maintain these standards because we buy our paper from a variety of top sources. These multiple sources are the key—if one should fall below par, the others are there to supply our needs. We don't have to take less than the best.

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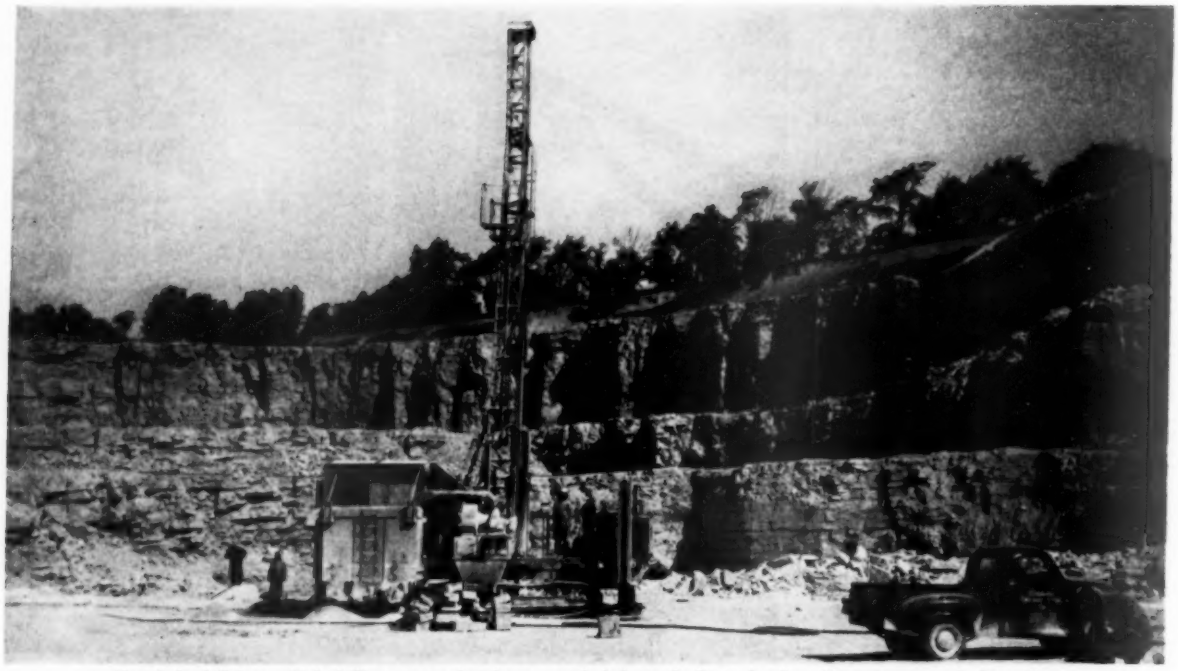


Blast hole drill has a high drilling rate and sinks a smooth hole to facilitate loading. Note quarry rock formation

Drilling for Better Breakage

Elmhurst-Chicago Stone Co., Elmhurst, Ill., uses blast hole drill to speed up drilling. Millisecond delays result in better distribution of explosive forces, more fragmentation and less vibration

By RALPH S. TORGERSON

INCREASING DEMANDS for crushed stone have led the Elmhurst-Chicago Stone Co., Elmhurst, Ill., to adopt methods and equipment which will help to increase production and hold costs in line. It is ultimately planned to place the primary crusher on the quarry floor and provide for a large surge storage pile over a reclaiming belt conveyor to transport the crusher product to the plant for further crushing and screening, but this step will have to await the enlargement of operations at a new, lower level now being worked.

One of the steps taken by the company to increase production has been the addition of a Joy Champion, heavy-weight blast hole drill machine, developed by Joy Manufacturing Co., in November, 1951. The primary voltage to the drill is 4000 volts a-c which is reduced by transformers, mounted on the drill frame, to 440 volts a-c. This drill, equipped with a Hughes Tricone W7R bit, has taken the place of four churn drills. However, one churn drill is still used to drill for wall trimming as it can operate within 3 ft. of the quarry face. Theoretically, the Hughes bit does not penetrate, due to its rotation; it penetrates due to the downward pressure on its contacting points or teeth, exceeding the compressive strength of the stone being drilled, causing it to shatter eruptively. In other words, it is a crushing action rather than chipping, wearing or cutting action. The drill is cooled and kept clean by a high-velocity air system.

Front end of blast hole drill showing power unit which supplies auxiliary power to maneuver drill in the quarry

Drilling Methods

Stone being drilled is a tough dolomite in horizontal beds. Drilling and blasting has been done at three levels. The first level is 70 ft., the second is 48 ft., and the third is 26 ft. Present drilling is to a fourth level at a depth of 27 ft., so that eventually the lowest

ALL THE WAY TO THE PUMP YOU'LL FIND **AMSCO** FITTINGS

Look at the illustration. Starting with the *enclosed-type flap valve,* in the foreground, you will pass one Amsco manganese steel fitting after another . . . all the way to the dredge. Chances are the pump will be Amsco, too.

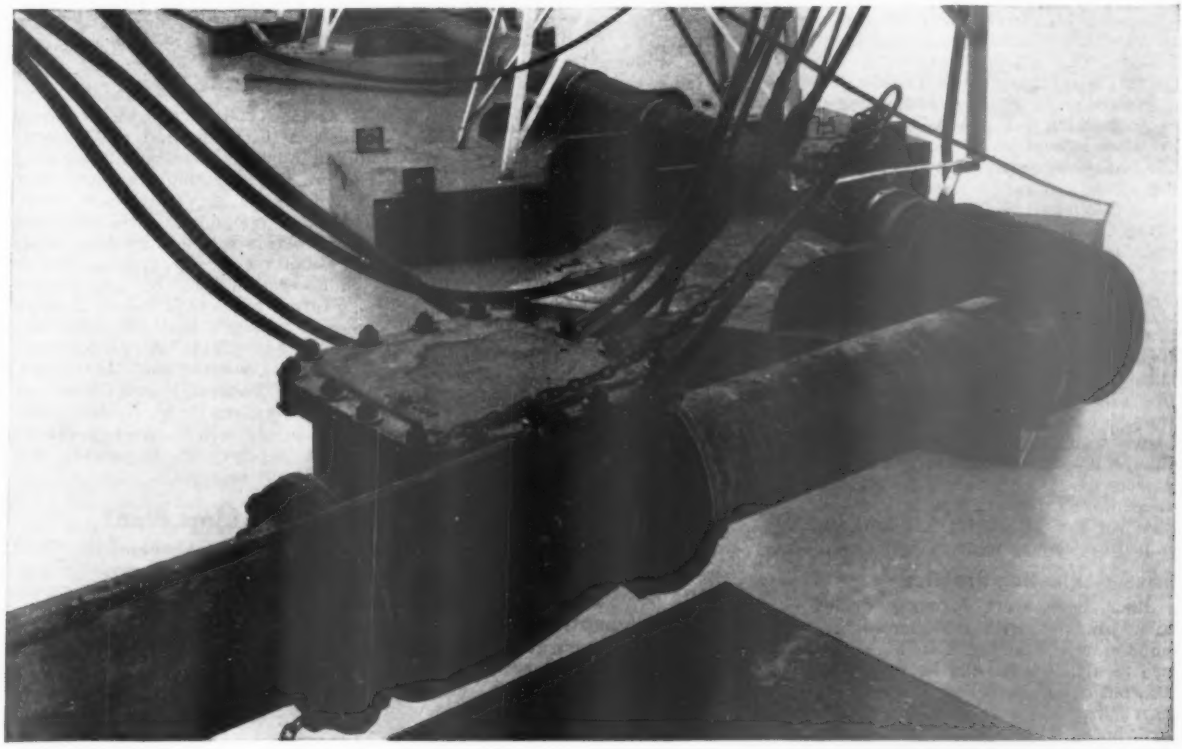
Operators everywhere are finding that for long service life under high pipeline velocities and pressures, Amsco manganese steel fittings serve best. These fittings are built to withstand both the shock of large stones and the abrasion of sand-laden water.

Manganese steel also offers a safety factor. When finally worn thin, it doesn't just break through all at once. Slow leaks give ample warning that it's time for replacement.

For pumping service and foolproof pipeline transmission, be certain you specify Amsco manganese steel . . . the toughest steel known.

AMSCO PIPELINE FITTINGS

Elbow · Hose nipple · 90° Elbow · Bulkhead fitting · Open-type flap valve · Handhole fitted straight nipple · 45° long radius elbow Straight · Enclosed-type flap valve



AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

Left: A 3½-cu. yd. electric shovel loading stone into 6 cu. yd. haulage unit. Right: Trucks haul stone to hopper from which stone is loaded to cable-drawn cars that carry the material to the plant

level will be 171 ft. from the top of the quarry. Stone now being drilled is generally harder than the upper strata, but it is in thinner beds. Beds now being drilled average 15 in. in thickness as compared with beds formerly worked which ranged up to 12 ft. in thickness.

The Joy drill is operated at an average rate of 30 ft. per hour, but it has been operated at 60 ft. per hour. An average rate of 30 ft. per hour is maintained to fit in with plant production requirements and also for most economical bit life. The down-pressure on the bit is a determining factor in bit life. The pressure cannot be at an excessive rate as the Tricone bit is composed of three rotating cones, each of which is supported internally by three sets of bearings, one sleeve, one ball bearing and one roller bearing. The lubrication and cooling of these bearings is by means of the air which travels through special airways and, upon leaving the bit, augments the air for chip evacuation. These bearings distribute between all nine of them, the total of the downward thrust, plus the torque applied in rotation. Therefore the greater the pressure exerted, the shorter the bearing life, and consequently the bit life. At the present average rate of 30 ft. per hour, the bit life is about 2000 ft., although bits have occasionally been replaced sooner when harder rock is encountered. No attempt is made to sharpen bits as the bit life is determined by bearing wear.

Blasting Practice

Blast holes were formerly drilled to a 9-in. dia. with the churn drills, but the new rotary well drill is equipped to drill 6¾-in. dia. holes. A 6-in. DuPont dynamite is now used as compared with 7-in. in the 9-in. churn drill holes. Although the drilling pattern is varied somewhat in accordance with stone characteristics and conditions, a square pattern is generally used. Drilling is now being done to a depth of 53 ft., including 3 ft. below the quarry floor. The 6¾-in. dia. holes are smoother, permitting more efficient loading of explosive, and with more holes there is a better distribution of the explosive forces, less breakage, and more fragmentation. Buffer shooting is followed, using millisecond delays. A primacord trunkline is employed with 17 millisecond delays and an electric blasting cap detonator. The explosive factor is 2¼ tons of stone to 1 lb. of dynamite with buffer shots and 2½ tons of stone to 1 lb. of dynamite for open face shots. This method has resulted in only a small percentage of cap rock requiring secondary plug drilling with jackhammers and blasting.

A 3½-cu. yd. 100B-Bucyrus-Erie electric shovel loads the 6-cu. yd. haulage units in the quarry. There are five of these large capacity International K-11 units to haul stone to the plant.

This company was one of the earliest pioneers in experimentation with millisecond delay blasting, and its quarry operation has served as a laboratory in trying out new blasting methods and explosives. As the quarry is close to Elmhurst, a suburban community of fine homes near Chicago, the question of public relations is of paramount importance. The new drilling and blasting practices of the company have been very largely responsible for the practical elimination of blasting complaints.

Herbert E. Manahl is superintendent; R. G. Canfield is assistant superintendent; Leland Gibson is quarry foreman; and Frank Bottoms is driller.

Cement-Composition Siding

A CEMENT-COMPOSITION SIDING, with the appearance and durability of clapboard, has been developed by Tilo Roofing Co., Stratford, Conn., as recently reported in *Asbestos*. The new product, Tilostone TK-33, is manufactured principally from cement and reinforced with asbestos fibers. Its use is said to provide a weather-proof siding more durable than wood, to provide effective insulation, and to eliminate the need of exterior painting. The siding can be applied in any color desired, as its color results from a low-pressure spray being applied after the neutral color base siding has been put on the house. The spray can also be effectively applied over older conventional asbestos siding.

The clapboard appearance of the siding is produced with the use of an automatic machine, the precision-broacher, developed by Tilo engineers. The machine is said to be the first of its type to be used by the roofing and siding industry. The clapboard look is achieved with a broach blade which reportedly produces shingles with an even edge which will not splinter.

Expands Plant

KAISER-NELSON CO., Cleveland, Ohio, producer of sand and gravel, and an industrial steel reclaiming contractor, is expanding its plant and office facilities at Valley View, Ohio. The company operates three sand and gravel plants in the Cleveland area. The steel reclaiming division, which handles reclamation of open-hearth slag refuse which is processed through screens, crushers and magnetic separators, has plants at Youngstown, Mansfield, Cleveland and MacDonald, Ohio, and Donora, Penn. Officers of the company are G. W. Kaiser, president; H. J. Nelson, vice-president; Joseph B. Horwitz, treasurer; and Jack Bayer, secretary.

Canadian Lime Plant

STEETLEY OF CANADA, LTD., West Flamboro, Ont., which recently purchased the Canada Crushed Stone Co. quarry, is building a new rotary kiln plant for the production of hard-burned dolomite. Completion of the plant, which will cost approximately $2,000,000, is expected by March, 1954, according to N. M. Peech, president.

Aggregate Plant

HOBBS ROCK PRODUCTS CO., Hobbs, N. M., has opened a plant near Hobbs, for the production of concrete aggregate and road paving material. Production is about 600 cu. yd. per day. Louis E. Hubbard is plant manager.

Cedarapids Built by IOWA

UNITIZED PLANT

HERE'S the way to outproduce your competition, handle *any* aggregate producing job that comes along . . . and do it at the low production costs that mean a tidy profit on every job.

The Cedarapids Unitized Plant shown above produced four products at a time . . . lime dust from 1/8" down, 3/4" Class A road rock, 3/8" minus material and 3/8" to 3/4" aggregate . . . at a rate of 210 tons per hour!

To meet specifications for other jobs, the basic primary crushing, scalping, secondary crushing and bin units can be combined in dozens of different ways to produce any size products in volumes up to 250 tons per hour or more in quarry operations. And you get real economy in operating and maintenance costs.

Your Cedarapids distributor can give you *all* the reasons why Unitized Plants are your best bet for beating competition. *Call on him today.*

USE THESE 4 BASIC UNITS IN ANY COMBINATION

PORTABLE PRIMARY CRUSHER reduces raw material to a size readily handled by the scalping unit or secondary crushing unit. Single and Twin Jaw Crusher or Double Impeller Impact Breaker units available in a wide range of sizes.

SCALPING UNITS, consisting of a single or twin jaw crusher and horizontal scalping screen, remove excess fines and dirt, and perform a crushing operation to reduce the circulating load for the secondary crushing unit. Choice of sizes.

SECONDARY CRUSHING UNITS are complete crushing and screening plants designed for high volume production of fine crushed products. Three types of crushers are available . . . roll, twin jaw or hammermill . . . to suit your job requirements.

BIN UNITS may be portable storage and loading bins, as shown above, or wet or dry screening, storage and loading units.

IOWA MANUFACTURING COMPANY • **Cedar Rapids, Iowa, U. S. A.**

Master Bituminous Mixing Plant

Vibratory Soil Compactor

Motorized Head Pulley

Model C-60—6000-lb. Bituminous Mixing Plant

Left: Primary jaw crusher with 3- x 8-ft. scalper. Front end loader used to blend sand into truck dumping hopper. Center: Belt conveyor inclining up to top of screening plant. Right: Screening plant has 5- x 16-ft. double-deck screen above 12-ft. scalping tank which unloads to sand screw. Below is the gyratory type crusher

Small Plant Meets Tough Specifications For New York Thruway

Kenneth and Madalyne MacKenzie, operating the Mac-Kenzie Sand and Gravel Co., Clifton Springs, N.Y., have built an efficient plant to supply big highway projects

By WALTER B. LENHART

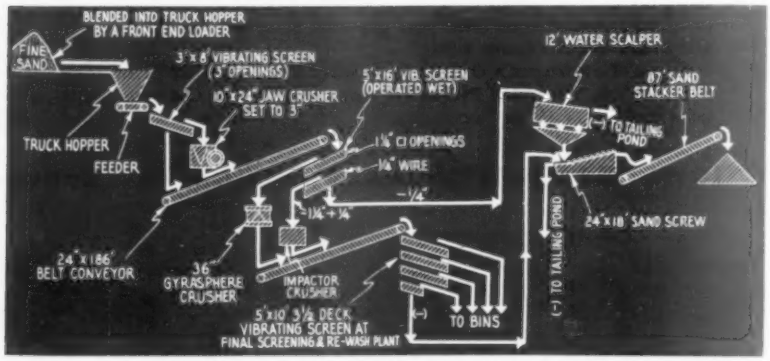
SEVERAL YEARS AGO Kenneth A. MacKenzie and his wife, Madalyne moved into Clifton Springs, N.Y., with a small sand and gravel plant. The marketing potentials were relatively small, being in the 125 tons per day range. The two made an ideal team to establish a sand and gravel business; Kenneth was an engineer and engineering-minded. Madalyne was the business head. Both were from down Texas way, but they liked the area to the south of Rochester, N.Y., so they went into business there.

For a while it was a two-person operation; Kenneth and Madalyne. The wife was not averse to putting on blue denims, grabbing a shovel, or doing anything there was to do around the plant. The spare hours were spent reading engineering literature relating to the sand and gravel business. Madalyne says she read some articles as many as a hundred times until she thoroughly understood all that was printed. One can talk to her about gradation, torque converters, and what-not and she understands the lingo of the trade possibly better than many operating men.

When the long-talked of Thruway, now being built by the New York State Highway Department, became an actuality, the couple had plans for grabbing off a sizeable part of the contracts for aggregates that were to go into this superhighway that passed close to their operation. They built a larger plant with all new operating equipment. A part of the older bin section was retained as a re-wash and re-screening plant.

The plant is quite simple, efficient and compact. The company has a fleet of five Brockway trucks that are loaded by a ¾-cu. yd. Koehring heavy-duty shovel. The trucks dump to a flat grizzly over the truck hopper under which is a Barber-Greene belt feeder serving a 3- x 8-ft. Seco scalper screen. Plus 3-in. gravel falls to a 10- x 24-in. Austin-Western jaw crusher set to 3-in. A 24-in. belt conveyor, 186-ft. centers, delivers to the Seco double-deck preliminary sizing screen, operated wet, which is mounted in the screening tower. Plus 1¼-in. gravel falls to a 36-in. Telsmith Gyrasphere reduction crusher. The plus ¼-in. minus 1¼-in. from the lower

Mr. and Mrs. Kenneth A. MacKenzie



Flowsheet of crushing, screening, bins and stockpiling arrangement

This Simplicity screen has already produced 6,150,000 tons limestone!

Simplicity Model D Double Deck Screen at McDonough Bros. Stone Company helps produce specially prepared limestone for metallurgical applications

This 4′ x 12′ Simplicity Double Deck Screen at McDonough Bros. Stone Company in San Antonio, Texas, has already produced more than six million tons of metallurgical limestone. And it's still going strong. A 24″ belt conveyor, running at 600 feet per minute, delivers 300 to 400 tons of limestone an hour to a crusher. Then the Simplicity Gyrating Screen separates the plus 4½″ material on the top deck and the plus 2⅝″ material on the bottom deck. Simplicity Screens, like those in operation at McDonough Bros., can help insure fast, accurate sizing and processing in your plant. And the simplified power and operating mechanism of Simplicity equipment helps keep maintenance costs down. For complete information, consult a Simplicity sales engineer or write us today.

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Simplicity
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ENGINEERING COMPANY • DURAND, MICHIGAN

One of five trucks operated by this company being loaded by ¾-cu. yd. shovel

deck falls to a 24-in. Stedman impact crusher that operates at 600 r.p.m. The purpose of this crusher is to increase the percentage of fractured material in the final products to conform to New York's Specifications that call for 75 percent fractured particles.

Throughs from both crushers fall to a belt conveyor that operates at right angle to No. 1. This belt delivers to a 5- x 10-ft. Seco 3½-deck screen, operated wet, which prepares four sizes of gravel that are binned. These are 1-A; No. 1; No. 2; and 3A.

Sand from the first Seco in the screening tower falls to a 12-ft. Eagle water scalper. This is a compartmented settling device designed to get rid of the excess water that might be present. Settled sand in the Eagle scalper falls to a 24-in. x 18-ft. Eagle sand screw. Any sand from the rewash plant is piped back to the Eagle screw de-watered. The finished product is ground-stored via an 87-ft. stacker belt. As the deposit being worked is deficient in fines, a fine sand from another part of the area is trucked to the hopper serving the plant, and is blended into the current pit material by means of a Hough Payloader. The pit runs roughly 60 percent gravel and 40 percent sand. The plant has a capacity of 250 t.p.h., and employs eight men. It went into operation during June of 1953.

A 3-in. Carver pump, operated with a 25-hp. motor, supplies water for the screens. The plant uses a total of 14 electric motors. All material is shipped by truck, and truck scales are provided. Sand is loaded to customer trucks by a 5 cu. yd. Haiss loader, and gravel is loaded by a 22-B Bucyrus-Erie shovel.

Welding Exposition

THE AMERICAN WELDING SOCIETY will hold its second welding and allied industry exposition at the Memorial Auditorium, Buffalo, N.Y., May 5-7, 1954. The society's national spring technical meeting will be held at the Hotel Statler, Buffalo, May 4-7.

Gravel Plant

CLARENDON STONE CO. has opened a sand and gravel plant on the Holley-Byron road near Clarendon, N.Y. Michael Christopher, Hulberton, N.Y. is general superintendent.

Empire State Association Meetings

AT THE WINTER MEETING of the Empire State Sand, Gravel and Ready Mix Association, held in Albany, N.Y., January 12 at the DeWitt Clinton Hotel, the principal guest speaker was David M. Kennedy, assistant to the U. S. Secretary of the Treasury. Mr. Kennedy reviewed the federal budget, tax, and debt management problems confronting the country. The meeting concluded with a dinner for the New York State Department of Public Works officials and legislators at which Mr. Kennedy spoke.

The preceding fall meeting of the association was held at the Utica Hotel, Utica, N.Y., on October 13 and 14, 1953. In three years of activity, this association has grown from a few members to some 97 active and 50 associate members. The association president is Leon H. Wendel, president, Gasport Sand & Gravel Co., Lockport, N.Y. Paul R. Smith, Buffalo, N.Y., is executive secretary.

Board meetings were held the morning of the first day with the afternoon session an open meeting. Stanton Walker, engineering director, National Sand & Gravel Association and the National Ready Mixed Concrete Association, was the principal speaker. He reviewed some of the results obtained during recent field tests relating to ready mixed concrete, pointing out that the mixing time was not as important as the actual revolutions of the unit. Tom McNaney, materials engineer, District No. 2 for the State of New York gave some interesting test results. The figures he gave were "breaks" (compression) of several jobs where ready mixed concrete was used. The tests were all of structural concrete, and a wide spread in the results was indicated. These were summed up by Mr. McNaney as showing that aggregates in one part of the state were better than in another. The afternoon session was preceded by a luncheon and followed by a cocktail hour and dinner.

The second day was devoted to a field trip to two plants; a ready mixed concrete plant and a sand and gravel operation. The ready mixed concrete plant inspected was the new operation of the American Hard Wall Plaster Co., Rome, N.Y., where the L.C.L. Corporation's air-activated transportation and unloading system for bulk cement was demonstrated. This system involves the use of containers—usually five or six to a carload—which, by means of compressed air, unload the bulk cement quickly without dusting. At the Rome operation, a 75-hp. Schram compressor supplies the air to unload a container holding 11 tons of cement in about 15 min. The containers are supplied at no cost to the user as the railroads using the system have working agreements with the L.C.L. Corp.

The demonstration was under the supervision of Proctor Eldred, Jr., of American Hard Wall Plaster Co. Horace B. Haddox and Lawrence G. Caldwell, vice-president and engineer, respectively, for the L.C.L. Corp. explained the system's operation. The American Hard Wall Plaster Co. will shortly place its third ready mixed concrete plant in operation, the newer plant being at Mohawk, N.Y. All three use the L.C.L. Corp. system of handling bulk cement, and a portable air compressor will suffice to serve all three plants. The Rome operation uses Erie equipment.

The second plant visited was the Boonville sand and gravel plant of Eastern Rock Products Co. with J. V. Owens, vice-president in charge of production, acting as host. The Boonville operation is an old one, and is essentially a sand producer. The highlights of this operation revolve about the use of two field conveyor belts that converge to a common belt conveyor with pit operations conducted so that blending is accomplished in the pit and ahead of the washing plant. The plant produces about 200 t.p.h. with a considerable portion of current production going to the New York State Thruway that is under construction. The sand from this plant is noteworthy for it gradation, cleanness and sharpness.

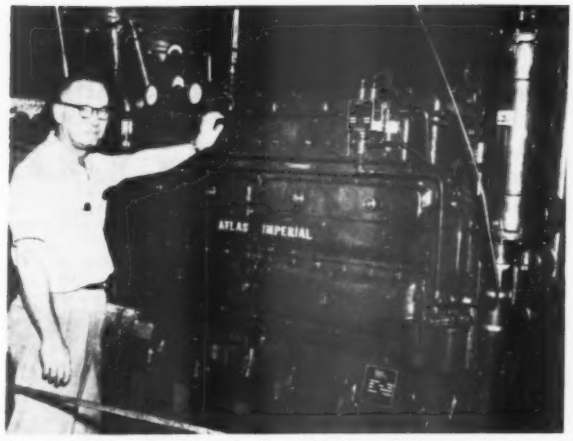
The meeting ended with a buffet luncheon where the visitors were the guests of the N. D. Peters Co., Eastern Rock Products Co. and American Hard Wall Plaster Co. at the summer home of T. D. Eldred at Forestport, N.Y.

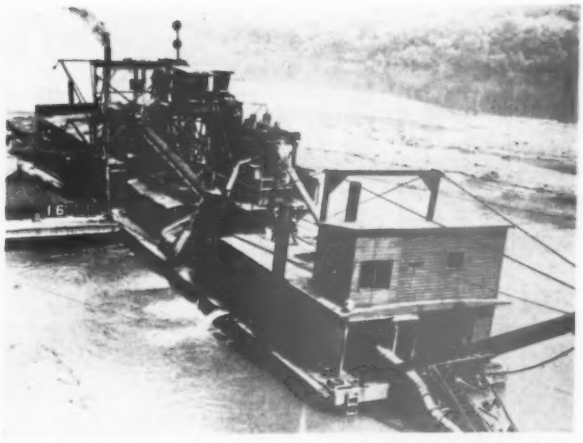
Student Award Program

SOUTHERN LIGHTWEIGHT AGGREGATE CORP., Richmond, Va., has established an annual award program for student architects at Virginia Polytechnic Institute and the University of Virginia. Fourth-year students at each school will compete, in separate contests, for first-place awards of $250, second-place awards of $150, and third-place awards of $100. Participants will be assigned a problem involving Solite, a lightweight aggregate produced by the company. The competition will be administered by the Virginia chapter of the American Institute of Architects.

Pumice Plant

EDGAR D. OTTO & SON, INC., Albuquerque, N. M., recently announced that it has discontinued the production of perlite. A new firm, Lava Pumice, Inc., has been formed to process and ship pumice. President of the new organization is William Eichhorst, Sr., of Lavaland Heights Block Co. Richard G. Otto, of Edgar D. Otto & Son, Inc., is secretary-treasurer.





Left: E. V. Rawn, president, is shown beside turbocharged engine which is mounted on an 18-in. skid to level it with dredge pump. Right: Close-up of big dredge in operation near Huntington, W.Va. Dredge hose, shown in foreground, leads back from the water to the 12-in. dredge pump. Capacity of dredge is 200 t.p.h. of finished product.

Completely Diesel-Powered Dredges

Ohio River Dredging Co., Huntington, W. Va., operates two dredges and two towboats which are driven by diesels

OHIO RIVER DREDGING CO., Huntington, W.Va., operates two diesel-powered dredges, two diesel-powered towboats and 20 barges. Materials are obtained at three different dredge sites along the Ohio River from Greenup, Ky., to Gallipolis, Ohio. Approximately 250,000 tons of sand and gravel were marketed in 1952.

The company's three dredging sites total about two miles of river frontage, each site running back about 500 ft. from the Ohio River. A 22-ft. glacial gravel deposit, underlies the 20- to 30-ft. overburden of "bottom land." A steam-powered, 3½-cu. yd. Whirley crane removes the overburden and places it in position to maintain the river bank. The main dredge, with a capacity of 200 t.p.h. of sand and gravel, uses a 12-in. dredge pump. The material is washed and screened on the dredge and then delivered by conveyor to barges.

In its operations, the company utilizes four Superior diesels and one Atlas diesel, furnished by The National Supply Co. The Atlas engine turns a shaft with multiple sheaves for transmission of power through 12 V-belts to a Thomas pump. Designed with a 6½-in. bore and 8¼-in. stroke, the turbo-charged engine is rated at 300 hp. at 1200 r.p.m. The pump, with a capacity of 9600 g.p.m., operates at 390 r.p.m., drawing 270 hp. from the engine at 1070 r.p.m. A shaft end sheave, or pulley, with V-belt, runs a 2-in. Gardner-Denver high-pressure water pump that supplies water to keep the pump free from grit.

Electric power for the big dredge is supplied by a Superior 100-kw. generating set and a 40-hp. electric motor drives the continuous chain scoop cutting head which loosens gravel to be picked up by the pump suction line. Other electric motors power the hoist for the cutting head and hose, the wash pump supplying water to the washing screens and to the deck hose, the two vibrating screens, the gravel belt conveyor, the two large loading belt conveyors, the sand bucket conveyor and the crushed gravel conveyor.

The "Pete," which does the principal towing job for the company, is a 73-ft. sternwheeler, powered by a Superior engine of 9-in. bore and 12-in. stroke, rated at 215 hp. at 500 r.p.m., but operated at 430 r.p.m. Equipment on the "Pete" includes a portable conveyor by means of which sand and gravel can be delivered for unloading at any desired riverfront spot. Capacity of this 24-in. Barber-Greene belt conveyor, is 200 t.p.h. It has a maximum reach of 435 ft.

For unloading in Huntington, a cable-drawn conveyor car system, using a 100-hp. reversible electric motor for power carries sand and gravel from the 1¾-cu. yd. clamshell of a steam derrick to the top of the storage bins which are located behind flood walls. Runways beneath the bins provide quick loading for truck-load lots.

E. V. Rawn is president, and Edward Peel is superintendent. A selling affiliate, Huntington Sand and Gravel Co., handles all sales.

Gravel, as excavated by pump from the deposit, is washed and screened on the dredge and delivered by conveyor to one of the waiting barges. Steam-powered Whirley crane in background removes overburden from gravel bed. The bank to left of barges is soil removed from the area in which the dredge is operating

Sales Agency Formed

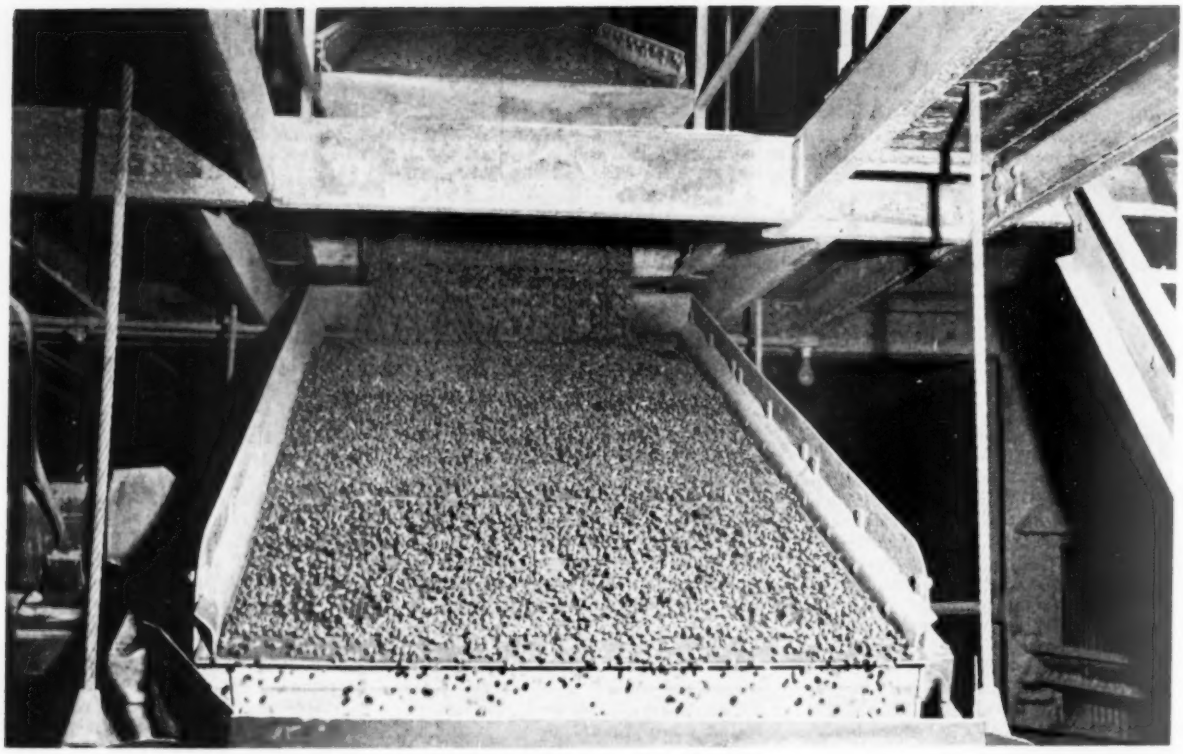
SOUTHWEST INDUSTRIAL MATERIALS Co., Dallas, Texas, is a new firm recently organized to serve as a sales agency for several non-metallic mining and milling operations within the Dallas area. The company will supply local industries with such materials as pumice, pumicite, tripoli, talc, bentonite, perlite and vermiculite.

SECO-IZING= BETTER SIZING

at the new modern light slag plant of

LORAIN SLAG CO.

Lorain, Ohio



Progressive Operator Has Four SECO Workhorse Screens on the Job

Here's another on-the-job performance story that dramatically points out the dependability of SECO Vibrating Screens. Pictured above are a 5x14 SECO (rear above) and a 5x12 (front) SECO taking the load smoothly and effortlessly in the modern, efficient plant of Lorain Slag Co. With these two screens and another 5x12 sizing screen and a 4x8′ scalper they have a winning team in getting production out, accurately sized and on schedule with a minimum of maintenance. Finished sizes include plus and minus $\frac{3}{8}$″ and 3/16″.

How about your screening problems? Why not get the advantages of SECO engineering exclusives for accurate, high production results on your job? You name the material, from Ag-Lime to Rip-Rap, and we'll recommend the right SECO vibrating screen for the job. Get the whole SECO story, today! No obligation. Write, wire, phone.

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Devoted to the Manufacture of Vibrating Screens Exclusively

INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

1 **AIR CLASSIFIER**—Hardinge Co., Inc., has published Bulletin AH-449 describing the line of "Gyrotor" air classifiers. Operational details, application flow sheets, diagrams and photographs are included.

2 **AUTOMATIC BOILERS**—Orr & Sembower, Inc. describes, in a four-page folder, "Powermaster" packaged automatic boilers in 17 sizes from 15 through 500 hp. for steam process as well as steam and hot water heating service. Also included are construction and operation features, typical installation photographs and specifications.

3 **BRICK VENEER** — American Cement Products has brought out a bulletin describing and illustrating the applications of "Quik-Brik," a plastered brick veneer for frame or concrete block homes.

4 **CEMENT COLORS**—Landers-Segal Color Co. has brought out a color card illustrating 24 of the most popular colors in its line of cement colors for concrete block, stucco, cement and lime paints, brick, tile, flagstone, etc. A previously announced booklet giving suggestions on uses is also included.

5 **CONCRETE MASONRY STRUCTURES**—National Concrete Masonry Association has published Vol. 9 No. 5 entitled, "Concrete Masonry Pictorial." Photographs of typical concrete masonry structures and various block patterns are given.

6 **CORE DRILLS**—Sprague and Henwood, Inc. has released Bulletin 340 illustrating and describing two sizes of its underground air operated core drills for diamond core-drilling or blast-hole drilling. Also included are summaries of the line of diamond bits and accessory equipment, and complete working data.

7 **CRANES**—Bay City Shovels, Inc., has released a pocket-size booklet entitled, "All Lifts are Easier with a CraneMobile." The booklet describes its line of mobile cranes, operation, and applications.

8 **CRANE SHOVELS**—Baldwin-Lima-Hamilton Corp., Construction Equipment Div., has announced the availability of descriptive bulletins covering Lima Type 44 1-cu. yd. capacity machine which is available in crawler or rubber mountings, and Type 803, a 2½-cu. yd. capacity machine. Working ranges and brief specifications are included.

9 **DIESEL TRACTOR**—Caterpillar Tractor Co. has released Form 30379 describing and illustrating the diesel D6 tractor. Model cutaways of the basic components are given as well as a double-page cutaway of the tractor itself. In addition to a specification sheet and attachment list, other equipment is suggested for use with the tractor.

10 **DRAIN PIPES**—Walker Cement Products Co., Poroswall Pipe Div., has issued a catalog describing and illustrating Poroswall drain pipes. Standard dimensions, strength requirements and advantages are included.

11 **ELECTRIC MOTORS**—General Electric Co. has published Bulletins GEA-6012, GEA-6013, and GEA-6027 describing the Tri-Clad "55" motors built in 1- to 30-hp. ratings. Maintenance, performance, and protective features are given as well as a double-spread cutaway drawing of each type motor, drip-proof, enclosed and gear.

12 **ELECTRIC POWER DRIVES**—Sterling Electric Motors, Inc. has announced a set of scale drawings for Geared-Slo-Speed electric power drives. The folder includes 22 separate sheets, with three views of the drive detailed on each page, the frame and type drawn to three separate scales.

13 **ELEVATOR BUCKETS**—The Standard Metal Manufacturing Co. has announced Catalog 100, illustrating and describing its line of steel elevator buckets. Specifications are given.

14 **ENGINE-TYPE SYNCHRONOUS MOTORS**—Allis-Chalmers Manufacturing Co. has released Bulletin 05B8008 entitled "Allis-Chalmers Engine-Type Synchronous Motors." Assembly features are described and illustrated, and modifications such as extra flywheel effect, split rotor and split stator are given.

15 **EXCAVATOR**—Koehring Co. has released a catalog describing the operating features of the Model 205 excavator, when equipped as a shovel, hoe, crane, or dragline. Photographs and diagrams are also given.

16 **FLUIDIZATION** — Sawyer Bailey Corp. has published a booklet describing and illustrating fluidization, the technique of handling dense phase solids in the same manner as liquids. A feeding system and centrifugal compressor are also described, giving power requirements, installation and maintenance data.

17 **FORK TRUCK** — Elwell-Parker Electric Co. has published a four-page brochure describing and illustrating its 2000-lb. capacity fork truck, the "Cargo Scout." Engineering drawings and design specifications are given.

18 **FRICTION-FLUID DRIVES**—Twin Disc Clutch Co. has released a revised 24-page issue of "Production Road" pointing out the "hidden connections" of its power linkage in the powered equipment of major industries. The diversification of its friction and fluid drives as used in various industries is described.

19 **GEARED FLEXIBLE COUPLINGS** — Link-Belt Co. has issued Folder No. 2375, giving detailed descriptions, dimensional tables and selection data on geared flexible couplings. Also shown are photographs which point out its features.

20 **GRAVEL PLANT**—Pioneer Engineering Works, Inc. has published Bulletin 647 describing the 35-S "In-Line" portable gravel plant. Specifications and details are listed.

21 **HARD-FACING**—Stoody Co. has published Vol. XV No. IV of "Fusion Facts." Methods of hard facing auger cutters, dozer blades, end bits and percussion drill bits are described. The coated tube Stoodite is also described and illustrated. Application photographs, before and after, are also given.

22 **HARDFACING ALLOYS** — American Brake Shoe Co., American Manganese Steel Div., has published a 48-page catalog describing the line of Amsco hardfacing and build-up rods and electrodes. Included are typical application illustrations, a technical section with charts and photographs, and metallurgical and physical properties of the automatic and manual rods and electrodes.

23 **HEATING EQUIPMENT** — Cleaver-Brooks Co. has issued Bulletin AD-109 covering its line of tank car heaters, bituminous boosters, Peak-Temp oil boosters, Deuce-combination tank car heaters and pumping boosters, and mobile, portable and stationary boilers. Illustrations and specifications are included.

24 **HOISTING EQUIPMENT**—Sasgen Derrick Co. has issued a 16-page catalog on derricks, hoists, winches and elevating and hoisting equipment. Illustrations and specifications are given.

25 **HYDRAULIC CRANE** — Austin-Western Co. has issued a booklet describing its hydraulic crane for indoor and outdoor applications. Typical application photographs, attachments, and specifications are included.

26 **INDUSTRIAL ENGINES**—The White Motor Co. has announced a folder entitled, "The Mighty Mustang For Your Industrial Engine Requirements," describing the company's line of industrial engines. Included are photos and engineering details and advantages.

27 **LOADING RAMP**—Rowe Methods, Inc., has issued a catalog sheet illustrating and describing the Commercial Adjust-A-Dock, Model No. 6 N.F., a 10,000-lb. capacity hydraulic adjustable ramp for loading docks. Included are photographs and engineering diagrams.

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28 **LOCOMOTIVE**—General Electric Co. has brought out Bulletin GEA-4657B giving information on the "Middleweight Champion," a 70-ton, 600-hp. locomotive. Cutaway views, charts and specifications are included.

29 **MANGANESE STEEL REPLACEMENT PARTS**—Kensington Steel Co. announced Bulletin 1051, describing "Oro" manganese steel replacement parts for the sand, gravel and crushed stone industries.

30 **MASONRY CEMENT**—Medusa Portland Cement Co. has issued a technical brochure describing Brikset gray masonry cement. General information and specification data on construction procedures are given. Mortar requirement tables are also included.

31 **MASONRY REINFORCING RODS**—Adrian Peerless Inc. has released a brochure describing "Wal-Lok" masonry reinforcing rods. The various types are given and specifications, side pressure and shrinkage crack test photographs are also included.

32 **MATERIALS-HANDLING MACHINERY**—Osgood-General has brought out Bulletin 5324, pictorially presenting its line of excavating and materials handling machinery, with condensed specifications.

33 **MATERIAL HANDLING TRUCK BODY**—The Wm. Bros Boiler & Mfg. Co. has brought out an illustrated folder on the Lectro-Lift material handling truck body. Specifications are included.

34 **MATERIALS HANDLING** — Sauerman Bros., Inc. has released a four-page brochure on long-range materials handling machines. Line drawings explain how the drag scraper, slackline cableway and tautline cableway operate. Typical application photographs are included.

35 **MOTOR GRADERS**—Caterpillar Tractor Co. has made available a folder, Form 30822, depicting its three sizes of motor graders. Typical application photographs are included.

36 **MULTI-WALL SACKS**—Hudson Pulp & Paper Corp. has announced publication of a 46-page pictorial review of paper-making, covering multi-wall sack manufacturing at its newly constructed mill at Palatka, Fla. Various tests and manufacturing processes are pictured.

37 **OSCILLOGRAPH** — General Electric Co. has announced the availability of a brochure, GEA-449B, on the general-purpose oscillograph for use in recording voltage, current, time, speed, pressure strain and sound of electric machinery for test, investigation and design.

38 **PUMICE**—Pumice Inc. has released a bulletin entitled, "Volcolite—The Story of Idaho Pumice." Descriptions, research data and testimonial letters are given as well as photographs and test results.

39 **PARTS KITS**—The Thew Shovel Co., Parts Div., has released a catalog describing and illustrating parts kits for Lorain machines. Modernization, conversion and replacement kits are covered. Specifications, photographs and drawings are included.

40 **PERLITE PLASTER** — Perlite Institute has issued an eight-page bulletin entitled, "How to Specify and Use Perlite Plaster Aggregate." Specification data, information on the perlite industry's certification and labeling program for plaster aggregate, and practical hints on the cause and prevention of cracks in all types of plaster are given.

41 **PYROMETERS**—The Pyrometer Instrument Co., Inc., has announced Catalog 85 giving detailed information on the "Pyro" optical pyrometer, technical data on its principles, application photographs and specifications.

42 **RADIO COMMUNICATIONS**—General Electric Co., Commercial Equipment Dept., has issued 10 bulletins describing improvements in its radio communication equipment. Six base station combinations and four mobile combinations are described and illustrated.

43 **REINFORCED CONCRETE EQUIPMENT**—Klingelhofer Machine Tool Co. has released a bulletin entitled, "Modern Machines for Reinforced Concrete." Illustrations and specifications of "Simplex" power bar cutters and "Perfect" automatic bending machines are given.

44 **ROCK DRILLS**—Joy Manufacturing Co. has announced Bulletin 87-X, describing and illustrating its line of "Silver Streak" rock drills. Specifications and operating features are included.

45 **RUST PREVENTATIVES** — Service Industries has released literature describing Feroz, a non-inflammable chemical rust disintegrator; Texstl C-D, a liquid compound for metal protection against rust; Ferozolene, a heavy duty rust preventative for outside use; and Acidulum, an acid-proof plastic coating for protection against acid solutions and chemicals.

46 **SAFETY FILM**—Caterpillar Tractor Co. has announced a film entitled, "The Gamblers," produced by Calvin Co., Kansas City, Mo., which points up the dangers of careless operation of heavy construction machinery. The film runs for 20 min., and may be seen by contacting any Caterpillar dealer, domestic and export.

47 **SANDSTONE**—Geological Survey has published Circular 249 entitled, "Lithologic character of the Buffalo River Valley, Newton County, Arkansas." Detailed descriptions of the St. Peter sandstone and Everton formations are given.

48 **SHOVELS**—Caterpillar Tractor Co. has issued Form 30791 showing the No. 6 shovel and HT4 shovel in a variety of earthmoving and industrial operations.

49 **SPUR GEAR HOIST**—Coffing Hoist Co. has made available Bulletin CH describing the "Challenger" spur gear hoist. A cutaway drawing shows the hoist details. Also included are dimension drawings and specifications.

50 **STEAM GENERATORS**—United States Radiator Corp., Cyclotherm Division, has brought out a pamphlet entitled, "All Your Questions Are Answered By Cyclotherm," explaining its patented method of Cyclonic Combustion heat transfer. Descriptive drawings and specifications are also given for its steam generators.

51 **STRANDED ELECTRODE MATERIALS**—Air Reduction Sales Co. is offering a 12-page reprint from the *Welding Journal* entitled, "Stranded Electrode Materials for Aircomatic Welding." Points covered include welding characteristics, case history applications, and construction of stranded electrodes.

52 **TIME SWITCHES**—General Electric Co. has released a 24-page bulletin, designated GEA-5965, giving selection and application information as well as descriptions of the various types and models of time switches. Features, illustrations, specifications, and operating data are also included.

53 **TRACTOR**—Caterpillar Tractor Co. has published Form 30825 on the D6 tractor. Illustrations, sectional cutaway views and a detailed specification sheet are included.

54 **TRACTOR-SHOVEL**—Drott Manufacturing Corp. has brought out Brochure No. 10, describing and illustrating its skid-shovel for International TD6 tractors. A line drawing points out the features of the unit.

55 **TRANSMISSION BELTS**—Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., has released a four-page, illustrated bulletin describing flat transmission belts. Included are recommended uses, specifications, construction data, sizes and lengths.

56 **WELDING ELECTRODES** — Wall Colmonoy Corp. has released Special No. 10, a data sheet describing Walmang electrodes. Physical properties, application methods and welding procedures are listed. Specifications and prices are also included.

57 **WIRE ROPE**—H. K. Porter Co., Inc., Leschen Wire Rope Div., has issued a folder entitled, "How to Get More Work Out of Your Wire Rope." Suggestions for correct handling and storing, and recommendations for proper use are included.

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Super-Tempered Precision Space Screens stay tight and wear longer under the most punishing attacks of vibration, abrasion and fatigue because they're made of hard and tough super-tempered steel, precision crimped and woven on powerful hydraulic looms. For greater tonnage output at lower cost, it pays to specify Super-Tempered Precision Space Screens. To order, write or phone our nearest sales office.

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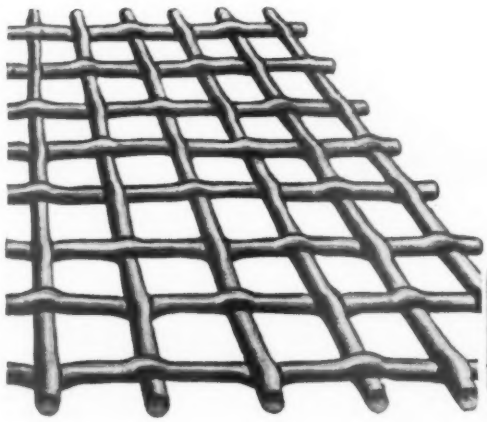

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1,000 ABK METAL wheels keep conveyors rolling at Basic Refractories

The largest dead-burned dolomite kilns in the world, at Basic Refractories, Inc., are fed by conveyors that roll on 1,000 wheels cast in ABK Metal. They're ABK because they must give long, trouble-free service while moving through variations of heat in an atmosphere of abrasive dust that is encountered in every cement or associated operation.

The controlled structure of ABK Metal—a Brake Shoe exclusive—makes these nickel-chrome iron castings far superior to other iron castings of identical hardness. Extended life of 4 or 5 to 1 is not unusual when ABK Metal replaces parts made of comparable metals. This is especially true where abrasion resistance is of prime importance.

Cut the cost of abrasive wear in your mill by specifying ABK Metal castings. Their long life will mean extra savings to you through reduced replacement, less maintenance and downtime costs and increased operating efficiency.

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BRAKE SHOE AND CASTINGS DIVISION

230 Park Avenue, New York 17, N. Y.

Labor Relations Trends

(Continued from page 61)

National Labor Relations Board enforces only a public right on behalf of the public interest, while state equity powers are invoked by a private party to protect a private right. The public right, it is said, is so distinct and dissimilar from the private right that federal occupancy of one field does not debar a state from continuing to exercise its conventional equity powers over the other. Support for this view is accumulated from the Act itself, its legislative history, some judicial expression, and professional commentary.

"It is true that the Act's preamble emphasizes the predominance of a public interest over private rights of either party to industrial strife, and declares its purpose to proscribe practices on the part of labor and management which are inimical to the general welfare, and to protect the rights of the public in connection with labor disputes affecting commerce.

* * *

"We are also reminded that this Court in Amalgamated Utility Workers v. Consolidated Edison Co., supra, at 265, recognized this distinction by saying, 'The Board as a public agency acting in the public interest, not any private person or group, not any employe or group of employes, is chosen as the instrument to assure protection from the described unfair conduct in order to remove obstructions to interstate commerce.' Various statements may also be cited in which the Board would appear to have recognized a distinction between public and private rights or interest in labor controversies.

"It often is convenient to describe particular claims as invoking public or private rights, and this handy classification is doubtless valid for some purposes. But usually the real significance and legal consequence of each term will depend upon its context and the nature of the interests it is invoked to distinguish.

* * *

State Labor Act

"Even if we were to accept as significant the distinction between public and private rights and regard the National Labor Management Relations Act as enforcing only public rights, the same reasoning would prevent us from assuming that the Pennsylvania labor statute declares rights of any different category. It is true that petitioners sought an injunction to restrain damage to their own business. But the injunction appears to have been granted because the picketing violated the state statute, and neither the statutory language nor the opinion of the Pennsylvania Supreme Court warrants a conclusion that the statute protects private rights, as most authorities would define the term. Passed in 1937, the statute recites that the growing inequality of

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SIZES 60"x48" to 10"x7"
Optional design features include: (1) Meehanite frame, sectionalized when necessary; (2) removable water-cooled bearings; (3) improved design of swing-jaw bearing; (4) force-feed oil lubrication, or circulating system if desired; (5) split flywheels; (6) flat or V-belt drive. Write for further details or engineering assistance.
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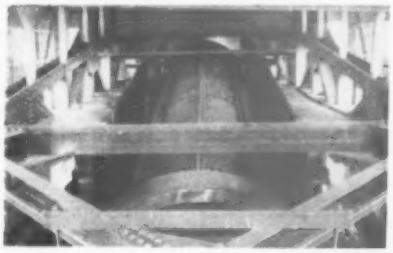
8A-4

YUBA Bucket Ladder Dredges for dredging placer properties including rare earths, etc.; handling sand and gravel, dam construction, channel changes, etc., Bucket sizes: 2½ to 18 cu. ft. or larger. Digging depths below water as required.



YUBA Abrasion Resisting Steel Screens—Flat or revolving for separating, scrubbing, sizing. Holes taper drilled to prevent clogging. All thicknesses from ¼" up; other dimensions as needed. U·S·S· AR plate carried in stock.

Stockton "Yubabilt" Clamshell Buckets, for channel, harbor and reclamation dredging. Two types: California and Power Arm (shown here). Three weight classes: heavy, standard, special light weight. ½ to 6 cu. yds.

YUBA DREDGES — PROVED DEPENDABILITY AROUND THE WORLD

57

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MANGANESE STEEL CASTINGS

for PULVERIZERS CRUSHERS ROLLS SCREENS

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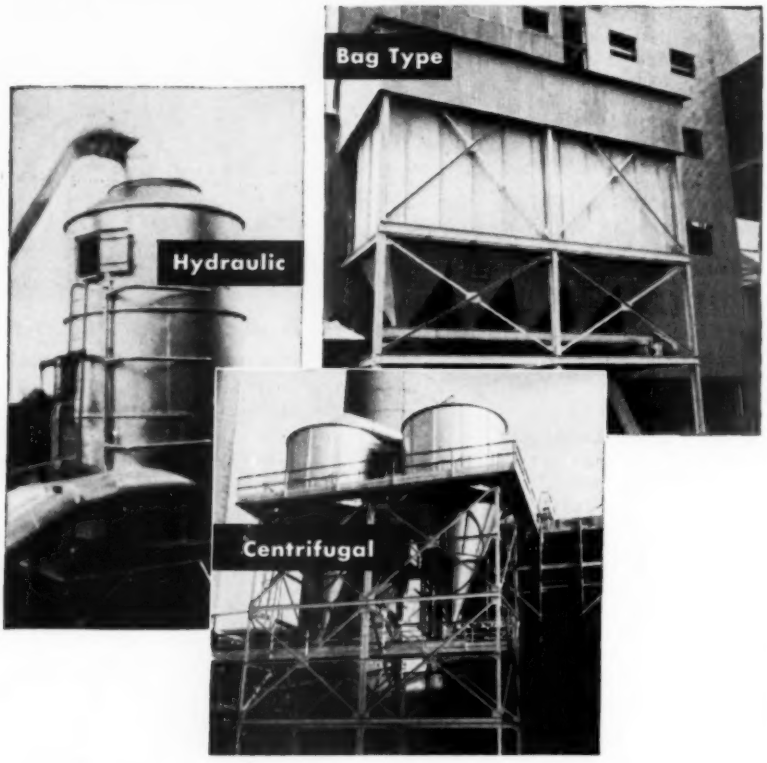
The Frog, Switch & Mfg. Co.

Established 1881 CARLISLE, PA.

Cancel the High Cost of Dust and Fume Damage with Norblo engineered collection equipment . . .



and salvage valuable elements economically!

Dust and fume collection fits into processing and manufacturing *in a big way*. Norblo has helped to implement this valuable aid to safety, health and economy in a big way with outstanding developments in three principal types of collection — Centrifugal, Hydraulic and Bag systems.

Norblo Systems are making new records for high recovery with low operating and maintenance costs. High-efficiency equipment is engineered to include the correct factors to suit your needs and carries the Norblo guarantee of performance. Get the facts on Norblo Dust and Fume Collectors before you decide on any dust or fume collection equipment.

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bargaining power between employers and employes 'substantially and adversely affects the general welfare of the State' and that certain practices tend to create 'industrial strife and unrest, which are inimical to the public safety and welfare, and frequently endanger the public health.' Encouragement of collective bargaining is declared 'the public policy of the State.' And one subsection reads: 'This act shall be deemed an exercise of the police power of the Commonwealth of Pennsylvania, for the protection of the public welfare, prosperity, health and peace of the people of the Commonwealth.'

"This language is comparable, on the state level, to the language in the Federal Act. If Congress was protecting a public, as opposed to a purely private, interest, the same could be said of the Pennsylvania Legislature. The State Supreme Court has not said otherwise. The court opinion, of course, did not analyze in detail the state law basis for injunction in this case because it found lack of state jurisdiction, and the dissenting opinion discussed the jurisdictional aspect of the case and did not reach the merits. But we find no basis at all for petitioners' argument that the equity courts, which in Pennsylvania enforce the labor relations statute, would enforce rights of any different category, or of any less public or more private character, than those enforced by National Labor Relations Board.

* * *

"Our decisions dealing with injunctions have been much concerned with the existence and nature of private property rights, but no case is cited or recalled in which this Court has recognized the distinction between private and public rights to reach such consequences as are urged here.

"We conclude that when federal power constitutionally is exerted for the protection of public or private interests, or both, it becomes the supreme law of the land and cannot be curtailed, circumvented or extended by a state procedure merely because it will apply some doctrine of private right. To the extent that the private right may conflict with the public one, the former is superseded. To the extent that public interest is found to require official enforcement instead of private initiative, the latter will ordinarily be excluded. Of course, Congress, in enacting such legislation as we have here, can save alternative or supplemental state remedies by express terms, or by some clear implication, if it sees fit.

"On the basis of the allegations, the petitioners could have presented this grievance to the National Labor Relations Board. The respondents were subject to being summoned before that body to justify their conduct. We think the grievance was not subject to litigation in the tribunals of the State.

"Judgment affirmed."

Widen your profit margin!

OSGOOD ROCK SHOVELS with Torque Converters load more rock...in less time...with less wear

OSGOOD-GENERAL
Power Shovels, Cranes, Draglines, Clamshells, Pile Drivers and Hoes
10 to 60 tons capacity
½ to 2½ Cubic Yards
Crawlers, Trucks, or Wheelmounts
Diesel, Gasoline or Electric
Machines designed with your profit in mind

Reports from the quarries reveal that OSGOOD Shovels with Torque Converters are setting new production records because of faster loading cycles and smoother operation that drastically reduces wear and maintenance. Operators especially like the fact that these OSGOODS cushion the shocks and will do anything in the book—even "pick-toe," for instance—a maneuver that is practically impossible with many other machines. For detailed information, consult the nearest OSGOOD-GENERAL Distributor.

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OVER 100 YEARS OF ENGINEERING PROGRESS

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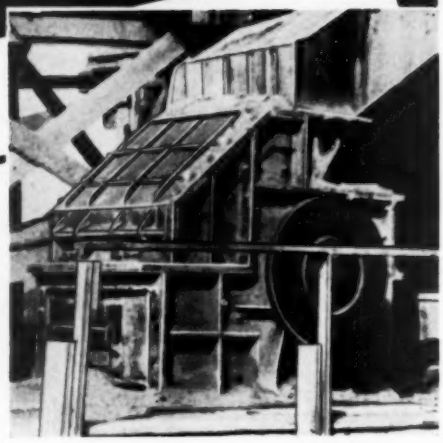
AMERICAN HAMMERMILL
PERFORMANCE REPORT

50,000 TONS OF -5" ROCK TO AGLIME

... WITHOUT A SINGLE REPAIR

FIELD REPORT
No. 21
Illinois Quarry



TYPE OF CRUSHER:
American ACS No. 4 Up Running Hammermill.

OPERATION:
Reducing minus 5" rock to agricultural limestone.

PRESENT CAPACITY: 60-120 tons per hour, depending on moisture content of stone.

PROBLEM: Very wet rock, showing 8% moisture—sticky at all times.

COMMENTS FROM USER: "Hammer wear is remarkable: 9400-9700 tons of lime ground to 100%, passing No. 8 mesh, per set of hammers . . . Remarkably efficient mill . . . meets our requirements in every way."

Write: for Bulletin No. 147 — "Better Stone Crushing"

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1245 Macklind Ave. St. Louis 10, Mo.

Lightweight Aggregates

(Continued from page 110)

with fusibility ranging from 1000 deg. C. to about 1320 deg. C. which expand satisfactorily on heating.

Extraneous materials, usually referred to as "impurities" in a clay or shale, are chiefly responsible for the bloating phenomenon. Bloating results from the generation and expansion of gas or vapor within the mass itself when the material has been heated to incipient fusion and is in a semiplastic state.

Materials with large bloating-temperature ranges (temperature ranges over which satisfactory expansion takes place) are generally more suitable for rotary-kiln processing. Although there are exceptions, depending on the material used, this temperature range should exceed 100 deg. C. As the bloating-temperature range decreases, the chances for agglomeration and sticking in a rotary kiln increase. Materials suitable for rotary-kiln firing and also those that have too narrow bloating-range temperatures are also often suitable for sintering. Both rotary-kiln and sintering methods of processing are used in commercial plants.

Sintering Process

In the Missouri Basin Region there are six plants—two in Kansas, one in Missouri, one in South Dakota, one in North Dakota and one in Colorado. At least four of them have been constructed since 1951. One of the plants in Kansas is a sintering plant. In sintering operations, crushed coal is mixed with the crushed raw feed and pelletized before firing. In rotary kiln operations the raw material is crushed to a limiting coarse size and transferred to the kiln which may be fired with either natural gas or fuel oil. The bloating product from either process is cooled, crushed and screened to size for shipment. Undesirable fines may be mixed with the raw feed as desired or necessary.

The Bureau of Mines has conducted research on lightweight aggregate for a number of years, with principal emphasis on technology, utilizing various types of equipment, developing adequate testing methods and in determining some basic factors affecting bloating. Recently the Bureau made a reconnaissance survey of a number of deposits in North and South Dakota. "Spot" samples were collected from a number of deposits of clay, shale, pumicite, and clinker for test purposes. Small-scale laboratory equipment was used in determining the bloating properties of the samples.

Out of 37 samples from 21 deposits in North Dakota and 26 samples from 13 deposits in South Dakota, nine and 12 samples, respectively, were indicated to be good bloaters. Of the deposits sampled, the best materials were from five areas or deposits in North Dakota and five in South Da-

7 solid reasons why it pays to standardize on LINK-BELT IDLERS

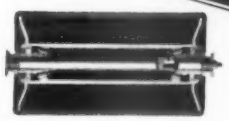
1 STRONG, RIGID FRAMES support rolls in perfect alignment. Rolls are securely held in place but can be easily removed for inspection and service.

2 CONCENTRIC ROLLS have smooth surfaces and rounded edges. Machine-made, continuous welds prevent entrance of dirt and moisture—assure hop-free rotation.

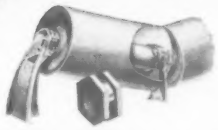
3 HUSKY, HIGHEST QUALITY BEARINGS, free and easy turning, provide concentricity and perfect alignment for smooth operation, minimum belt wear, low power requirements.

4 SAFE, CONVENIENT GREASE FITTINGS provide ease of lubrication. Extensions can be furnished for greater accessibility in out-of-the-way locations.

5 POSITIVE, COMBINATION GREASE SEAL unit retains lubricant, prolongs bearing life. The most effective seal offered in idlers today!



6 ROLLS consist of a counterbored outer shell plus a full-length, heavy central tube of $\frac{3}{16}$-in. steel. Both tube and shell are welded to dished steel heads to maintain balance and bearing alignment.



7 HEX NUTS provide bearing adjustment at shaft ends and prevent rotation in service. Nuts prevent bracket from spreading under unusual impact.

Get the right idler from industry's most comprehensive line

Link-Belt makes more than 500 belt conveyor idlers in 34 types. You can select from light, medium or heavy-duty 20° troughing idlers, two types of 45° idlers, flat belt, belt training, rubber cushion and the new Link-Belt variable troughing idler. Most are built in a broad range of roll diameters and belt widths with matching return idlers. Ask your Link-Belt sales representative or distributor for new 48-page Book 2416.

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BELT CONVEYOR IDLERS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

WELLMAN "Williams" MULTIPLE ROPE BUCKETS

Designed for digging bigger payloads

THE *double* main hinge design of these WELLMAN "Williams" buckets gives you many advantages including: lower head room when boom or crane operations are cramped; stronger, more compact construction; and a really "long reach".

These tough, top-quality buckets are fast operating and give the operator perfect control at all times.

If it's a WELLMAN—it's built to dig and last while digging.

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kota. Those in North Dakota are in the vicinity of Marmarth, Williston, Belfield, Zap and Minot. The indicated favorable deposits in South Dakota are in the vicinity of Mobridge, Iona, Chamberlain, Gregory County and Fort Pierre. Samples from areas heading the lists had bloating-temperature ranges exceeding 200 deg. C., whereas those at the end of the lists had ranges of 50 deg. C. to 100 deg. C.

As the favorable samples merely indicate the presence of suitable raw materials in the localities investigated, drilling and small-scale pilot-plant testing will be required to prove reserves, and to determine the average quality of the deposits as materials for lightweight aggregate.

Lime Research

(Continued from page 120)

of diagonal line running through several curves of Fig. 1. A considerable portion of Dr. Wuhrer's paper is devoted to this phase.

I have given this subject of Fundamental Mechanics of Calcination much thought over many years, covered by my first A.C.S. paper of over 25 years ago, a later A.S.T.M. paper, and the X-ray diffraction studies of 15 years ago. I was searching for an answer in the region of the Angstrom unit, ten thousand times smaller than the micron unit where Dr. Wuhrer found it.

But still, and in spite of it all, the origin must be within the lower Angstrom region, as it is there where the initial crystallization, the initial unit cells form, which rapidly grow to the relatively coarse .3 micron size of the "softest" burn. It is there where the combinations take place that determine the eventual location of the sinter point and also the increments by which the density lines will vary between the various temperature ranges of Fig. 1.

It all is very pleasing to me since, as indicated by some of his remarks, Dr. Wuhrer and I were in rapport over many years. And even more because when his article was being published, emphasizing the "Importance of Temperature Control," my paper on "Attainment of Temperature Control" was being presented before the Birmingham meeting of N.L.A., and published in the December, 1953 issue of ROCK PRODUCTS.

Buys Limestone Deposit

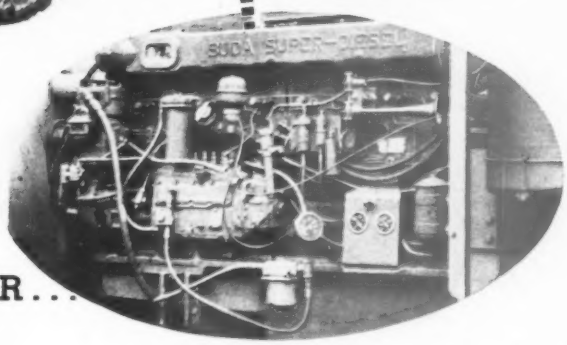
UNION DRAWN STEEL CO. LTD., Hamilton, Ont., a subsidiary of Republic Steel Corp., has announced acquisition of a limestone deposit of over 1100 acres at Embro, near London, Ont. The deposit will be used to supply Republic's open hearth furnaces for several generations, and it is located favorably for transportation to steel plants in the Mahoning Valley, Canton and Massillon. The acquisition is another step in the corporation's program to improve its sources of major raw materials.

BUDA DIESELS

POWER WORLD'S LARGEST TRUCK*

*Based on total tire capacity less net weight.

Model 600 Dart — 60 Ton Capacity. Powered by two Buda 8 DAS-1125 Super Diesels



One of two Buda Super Diesels powering new Dart 600.

BAGDAD COPPER *Again* PICKS BUDA DIESELS FOR *BIG* POWER... STAMINA...LONG LIFE!

Buda Diesels' superiority was demonstrated again when Bagdad Copper Mines picked two 8 DAS-1125 Super Diesels to power their new Dart 600 truck — called the largest truck in the world.

Deep, open pit mines are tough proving grounds for engines. The Buda Diesels powering other Bagdad haulage units are delivering such stand-out performance that Buda was the natural power choice for this giant new truck.

Your nearby Buda Distributor can show you how Buda Diesels will increase your equipment performance and profits. Ask him today. Write for Bulletins and data. The Buda Company, Harvey, Illinois. Division of Allis-Chalmers Manufacturing Co.

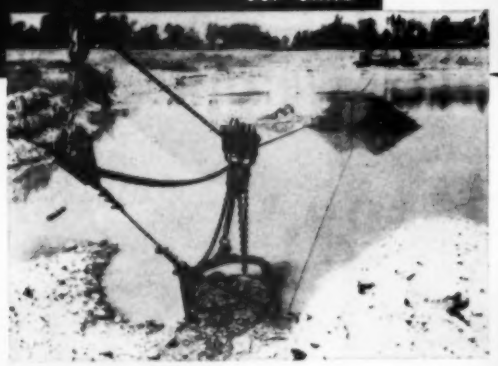
BUDA

a Power-Full and Dependable Name in Engines

BC-32

the pit:
tough... 70% ROCK
30% SAND

the machine:
Sauerman 2½-cu. yd. slackline cableway excavator



the result:

"...a full bucket every trip"

Another actual field report—Helena Sand & Gravel Co., of Helena, Montana, switched to this Sauerman equipment in 1946. It's been in operation since then . . . successfully performing difficult underwater excavation of rock and colloidal sand where other equipment had failed.

Sauerman Slackline Cableways span water, bogs or pits . . . reach far, dig deep, lift and carry loads to hoppers or cone piles. However tough the pit, Sauerman equipment brings in a good load every trip.

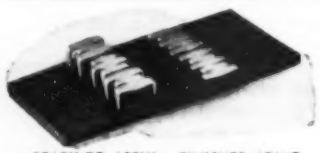
With a Sauerman Slackline Cableway, one man—in safe position—operates a single machine . . . does the complete job, quickly, efficiently, economically! Sauerman Slackline Cableways range from ⅓ to 3½ cu. yds.—span distances up to 1,000 feet . . . handle such materials as sand, gravel, clay, peat, ore and rock.

Write today for more information, including these handy field reports and catalog:

FR-216	Easy Excavating in a Tough Pit
FR-213	Cleaning Ponds Without Draining
FR-102	Digging Gravel From a River
Catalog C	Sauerman Slackline Cableways

SAUERMAN BROS., INC. 530 S. Clinton St. Chicago 7, Ill.

SAUERMAN BROS., Inc.



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TRADE MARK

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The DUAL PURPOSE LACING for PATCHING and SPLICING

No Special Tools Required:
JUST A HAMMER

BELT LACING
FOR: ALL CONVEYOR BELTING
¼" TO ⅞" THICK

Write for Bulletin and Name of Jobber

THREE POINT BELT LACING CO.
PEACE DALE, RHODE ISLAND
Formerly Mfg. by The Bristol Co.

Letter to the Editor—Durability of Concrete

SIR: It is not the first time that I feel uneasy with the observations about durability of concrete and Nathan C. Rockwood's questions in April 1952 issue, revive the problem.

For 25 years, I considered the Candlot salt (sulfo-aluminate of calcium) as the principal culprit. This I mentioned once in your October issue, 1948, page 95. I may be mistaken.

Although, in Europe concrete troubles are not half as bad as yours, I remained attentive to all available information, the more that several expert chemists expressed the opinion that there is no $C_3A3CaSO_4 \cdot 32\ H_2O$ in the mortar.

It is an actual fact that in many mortars with over 5 percent gypsum, the tensile strength starts decreasing while the compression resistance still rises with 6 or 7 percent gypsum.

At the London Symposium, Prof. K. Koyanagi, confirmed my opinion that in very dilute water cement mixtures, the electronic microscope neatly showed the Candlot crystals (Japanese tests). During his visit in Brussels, we aroused the interest of Prof. W. L. De Keyser, who utilizes every up-to-date X-ray equipment for analysis work, and he accepted the work of testing normal neat cement mortars.

After discussion of a program with Dr. M. Jaspers and Prof. De Keyser, we entrusted the experiments to J. Raucq (a student for a master's degree at University of Brussels) (now Lic.en Sc. Chim.).

Prof. De Keyser, who intends to proceed with a further study of the question, thinks it premature to publish the work of Mr. Raucq, but authorized me to relate here some first conclusions which seemed particularly important to us.

One thing seems sure, there is formation of Candlot salt in normal cement mortar of following composition:

	Percent		Percent
SiO_2	23.13	CaO	66.64
Al_2O_3	5.40	MgO	0.70
Fe_2O_3	3.29	Ign. loss	0.52
		Insol.	0.12

Mixtures of clinker and gypsum plaster of Paris have been made in the proportions of 3, 4, 5, 6, 8, 10, 12, and 14 percent gypsum.

Synthetically, Mr. Raucq produced:

Al_2O_3—3 CaO•Ca SO_4—12 H_2O (AC_3 + H_{12})
Al_2O_3—4 CaO•3Ca SO_4—14 H_2O (AC_4 + 3 H_{14})
Al_2O_3—3 CaO•3Ca SO_4—32 H_2O (AC_3+ 3 H_{32}).

He photographed the crystals and made the X-ray charts on a spectrometer with a Geiger counter of the North American Philips Co. Thermal and thermo-gravimetric analyses were used as controls.

Unhappily, for reasons of military service, the experiments could only be pursued during three months.

The general conclusions as far as they are connected with our apprehensions are:

—with 4 percent gypsum, already Candlot crystals are present after

SAMSON BLOCK CO. ADDS ERIE PORTABLE TRUCK MIXER PLANT — OPERATION NOW IS AMONG FLORIDA'S FINEST

"ERIE EQUIPMENT GIVES US ACCURATE BATCH CONTROL AND A PLANT ONE MAN CAN OPERATE".

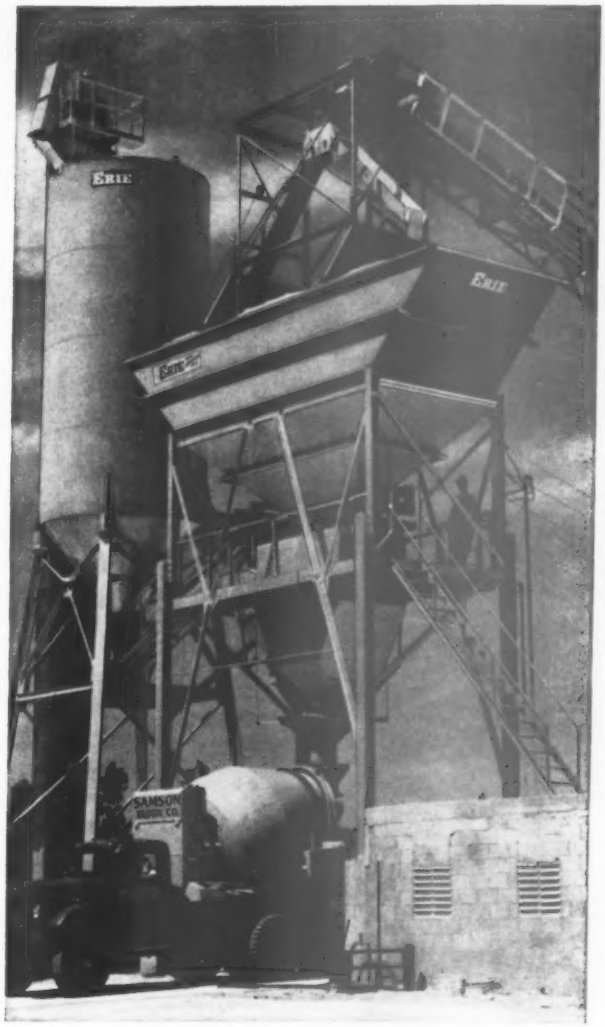
- - - MURRAY LEVINE

At Homestead, in the bustling Miami area, is one of Florida's best equipped concrete batching plants. It's the Samson Block Co., and it's the property of brothers Sam and Murray Levine.

The Levines launched themselves into this new venture seven years ago on a rather simple premise: "Make it good."

With quality as the keynote of production, Samson blocks have been accepted in greatly increasing volume year after year. It was inevitable that they should one day expand into the ready-mixed concrete field.

When they did, quite naturally, they shopped for equipment that would do the best job for them. They chose Erie. Here's why, in their words: "To manufacture quality concrete it takes not only skillful help and quality materials but the best equipment is needed, too."



One man operating this equipment produces 240 cu. yds. of specification concrete per hour. Installation includes: 3-compartment GTB-79 portable Aggre-Meter; BWC 4 cu. yd. weighing batcher; CSB 592 bbl. circular cement silo and DWK 36-cu. ft. cemeter. Sold by Neff Thomas Machinery Inc., Miami, Florida.

If you would like additional information on Erie equipment, write Dept. P24

Cable Address: EXIMPORT

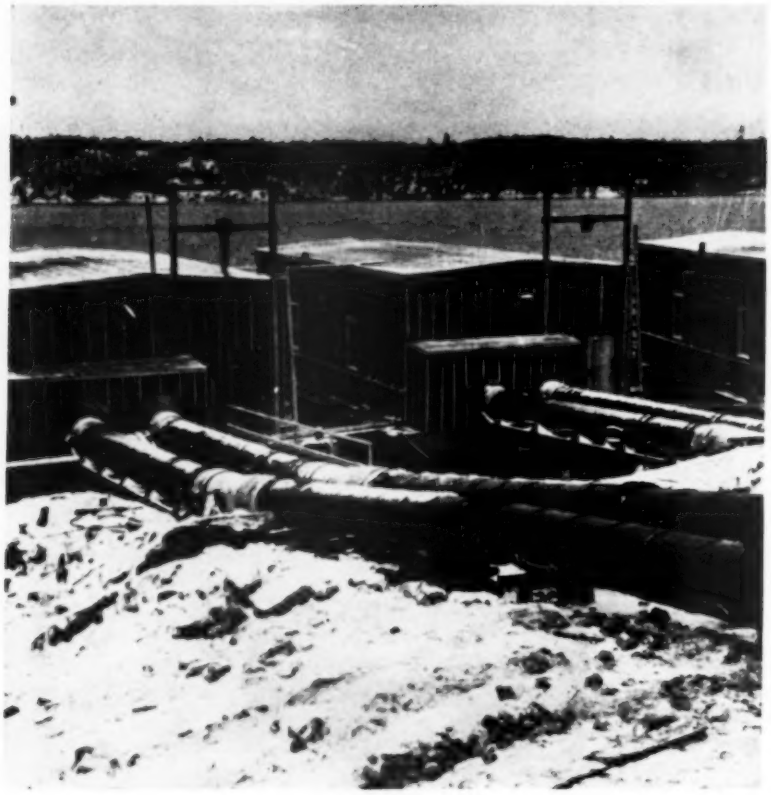
FORMERLY ERIE STEEL CONSTRUCTION COMPANY

ERIE STRAYER CO.

SAME PEOPLE • SAME PRODUCTS • JUST A NEW NAME

424 GEIST ROAD • ERIE, PENNSYLVANIA

THE EASY WAY TO GET RID OF WATER



Naylor light-weight pipe makes light work of getting rid of water. Its light weight makes Naylor pipe easy to handle and install, regardless of terrain. With its greater structural strength, you can count on plus performance in getting the job done.

Write for Bulletin No. 507 to get the whole story.

NAYLOR PIPE COMPANY
1237 East 92nd Street, Chicago 19, Illinois
New York Office 350 Madison Avenue, New York 17, New York

2 hours, next to $AC_4 + 3\ H_{14}$ and both rise with increase in gypsum addition;

—after 8 days $AC_4 + 3\ H_{14}$ increases slightly;

—after 1 month $AC_3 + 3\ H_{32}$ seems to have formed as $AC_4 + H_{14}$ has only slightly increased;

—after 2 months, $AC_4 + 3\ H_{14}$ has nearly disappeared and $AC_3 + 3\ H_{32}$ slightly increased. Accelerated aging at 50 deg. C. and excess water tests complete the experiments.

The study will be continued and we should be grateful for all information gathered by others.

We remain,

Yours faithfully,
J. A. Slegten

P. S. Through the courtesy of Dr. R. H. Bogue, I had great pleasure in reading the interesting experiments made by E. E. Higginson and D. G. Kretsinger, developing a relation between durability and thermal expansion of saturated concrete.

Compared to the splendid and very complete communication of F. E. Jones at the London Symposium, it calls attention in a new direction. I have ignored the composition of the cement which was used in these experiments.

If the danger lies in some, so far unsuspected, property of the aggregates, it does not dissuade me from the conviction that a sound mortar has more chances to bind more definitely than a disintegrating one. This is, unless the skeleton structure reacts; for instance, could the sand combine and prevent in some way the formation of Candlot salt?

Would it be possible for instance that the presence of siliceous magnesian limestone, or steel balls, could have any influence on the amount of Al_2O_3—3 CaO—3 $CaSO_4$—32 H_2O remaining free in the concrete?

I can only raise this examplative question.

J.A.S.

Bruxelles, Belgium
January 13, 1954

Lime Hydration

HOLBECK CORP. LTD., Toronto, Ont., has announced publication of the booklet, "Knibbs Continuous Hydrating Process," which discusses the hydration of lime and points out advantages of the Knibbs hydration system. Dustless operation, automatic differentiation of fast and slow slaking pieces, and low power requirements plus a top quality product, are among some of the advantages claimed for the system. Copies of the booklet may be obtained from the company at 1530 Bloor St. West, Toronto 9, Ont., Can.

Change of Ownership

COMPLETE OWNERSHIP of Brownsville Sand & Gravel Co., Brownsville, Ore., has been acquired by C. N. Mumper, who formerly owned and operated the plant in a partnership with L. J. East.

The Only Rotary Blast Hole Drill Capable of Drilling 12¼-in. Holes

The Bucyrus-Erie 50-R

Now, you can take full advantage of the large hole drilling technique with a rotary drill too—the Bucyrus-Erie 50-R. Here's a machine, designed to drill 9⅞ to 12¼-in. holes, which has proved its ability to drill these large diameter holes in the shortest time possible.

For example, a 50-R, operating on 6¾ hour shifts in a large Indiana open pit coal mine, drilled 2,598 holes of 10⅝-in. diameter to an average depth of 42 ft. in six months. The average drilling rate was 125.1 feet per hour for a total of 844.4 feet per shift. Overburden consisted of medium hard sandstone with an overlay of hard shale.

Look Over These Important 50-R Features

1 Down pressure on the bit is hydraulically powered for maximum controlled penetration.

2 Ward Leonard electric control on rotation of drill pipe permits drilling at most efficient speed for a given formation.

3 Drills continuously for 32'-8" before an additional drill pipe section is added.

4 Drill pipe sections are added or removed in a few minutes with a remote-controlled, power-driven tool handling unit. No heavy manual labor is involved.

5 Cuttings are removed from the hole as drilling progresses by two 640-cfm air compressors. *Only the "fines"* are picked up and handled by the Roto-Clone precipitator. "Heavies" pile up adjacent to the drill hole for use as stemming material.

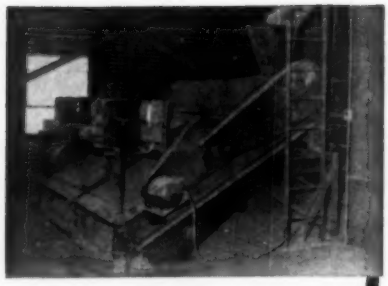
2854

There are many more reasons why the 50-R is the finest rotary blast hole drill ever built. Write for complete information today on how the 50-R can save you money in your mine or quarry.

BUCYRUS ERIE

South Milwaukee, Wisconsin

Flex Elex



HEATED SCREENS

LOWER THE BOOM ON PRODUCTION COSTS

Look for the toughest screening job you can find . . . the screening of damp fines such as damp lime, ag-lime or silica sand. On work of this kind, Leahy Screens equipped with FlexElex electric heating of the screen cloth are knocking the props out from under old cost standards.

FlexElex heating, with Leahy Differential Vibration clearing the mesh of intermediate size wedging particles, keeps the cloth open for full capacity screening, day after day. Idle time and manual cleaning are eliminated. Life of screen cloth is extended and production tonnage is pyramided.

The sum total of these advantages and economies pays for FlexElex in a matter of months. Send for Bulletin 15-J.

THE Leahy

THE DEISTER CONCENTRATOR COMPANY

The Original Deister Co., Incorporated 1906

915 Glasgow Avenue — Fort Wayne 3, Indiana

Canadian Expansion

ASSOCIATED QUARRIES & CONSTRUCTION LTD., Toronto, Ontario, is currently carrying out a four-fold expansion project designed to keep pace with the requirements of the expanding Canadian construction industry. The company is expanding the facilities of each of its four operating divisions, The Kirkfield Crushed Stone Ltd., The Hagersville Quarries Ltd., The Dual Mixed Concrete & Materials Ltd., and The Hagersville Asphalt Paving Ltd.

The Dual Mixed Concrete & Materials Ltd., reportedly will quadruple output of ready-mixed concrete and enable the company, in the coming season, to service the Greater Toronto Area from four strategically located modern pre-mixed concrete plants, all interconnected by teletype service to a central concrete-dispatching office. To further improve service, the mobile mixer fleet has been increased to 71 units, all equipped with two-way radio. New building material warehouses, equipped with modern material-handling equipment, have also been provided for ready access to contractors working in new development areas.

The Hagersville and Kirkfield quarries and crushing plants are also being modernized and expanded to produce crushed stone meeting the specifications and requirements of all the area's construction projects. Expansion at the company's asphalt plant includes increased production facilities and additions to the fleet of operating equipment.

Asbestos-Cement Products

THE MARKET for asbestos-cement products has been strong, but showed a normal seasonal decline in late 1953, as recently reported in *Asbestos*. According to the report, demand for corrugated about equals production, but activity in the re-siding field has been somewhat curtailed. The sales of pressure and sewer pipe continue at a good rate, and sales of warm-air duct, building sewer pipe, gas vent pipe and electrical conduits are continuing strong.

. . . *a honey of a Screen*

Combines Product ACCURACY of Round Perforations With CAPACITY of Square Perforations

CROSS Perforated Steel Sections and Decks are manufactured of Cross Special Analyses SCREEN Steel — designed for VIBRATING, SHAKING and REVOLVING Equipment.

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. . . CASTING FOR PROFIT—

There is probably only one good reason for your being in business. In the final analysis this reason can be summed up in one word — PROFIT. And that means each piece of equipment must show profitable operation — produce bigger performance — require minimum maintenance. Here, for instance, are two ¾-yard Model 45 machines — each doing its job in the production and handling of sand and gravel.

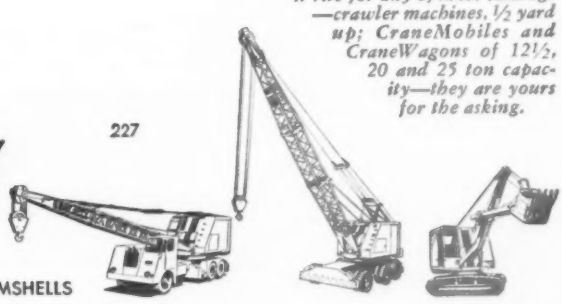
Glance at the dragline photo again and note how the bucket is cast far beyond the boom point. This illustrates the easy operation, free-running machinery and accurate control plus fine balance which is built into this heavy-duty dragline. It has long, wide crawlers, alloy-steel bases, tandem drums in ball bearings, helical-cut gears, 517-cu.-in. gas engine, booster clutches and many other time-saving, money-making features.

Why not get the complete story from your nearest BAY CITY dealer or write direct for catalog.
BAY CITY SHOVELS, INC., Bay City, Michigan

Write for any of these catalogs —crawler machines, ½ yard up; CraneMobiles and CraneWagons of 12½, 20 and 25 ton capacity—they are yours for the asking.

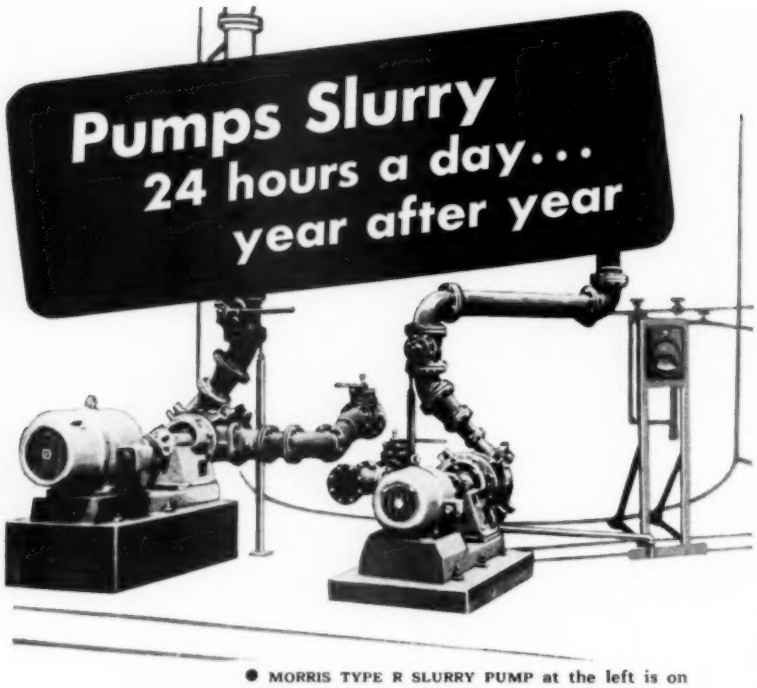
227

BAY CITY



SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

Pumps Slurry 24 hours a day... year after year



● MORRIS TYPE R SLURRY PUMP at the left is on continuous 24-hr. duty delivering 1000 GPM of a 170° lime slurry at 100′ head. Fifty-HP motor operates at 1180 RPM. Intermittent-duty pump at right delivers 200 GPM at 50′ head with 7½-HP motor turning at 880 RPM.

In slurry-handling operations, "long-term service" is a meaningless claim unless the pump will work day-in and day-out with a minimum of maintenance time, trouble and expense

Morris Type R Slurry Pumps—with an established reputation for longer life—also incorporate in their design exclusive features which result in easier installation . . . fewer interruptions to service...less overhaul...fewer replacements.

To provide uninterrupted service . . .

The gland is under suction pressure only. This reduces leakage and dilution . . . keeps harsh abrasives out of the stuffing box . . . practically eliminates packing troubles.

There are no internal studs or bolts. Caustic and corrosive solutions cannot seep past threads and cause maintenance headaches.

To make installation and dismantling easy . . .

Shell is interchangeable for right or left hand rotation. Suction and discharge nozzles can be rotated around the axis of the pump to a total of 72 different locations.

Impeller removed without disturbing the piping. You simply loosen 4 *outside* clamping bolts and pull off the end cover. This feature alone saves considerable time and labor.

● *Free Service.* Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send necessary data today . . . include request for Bulletin 181.

MORRIS MACHINE WORKS
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Sales Offices in Principal Cities

MORRIS *Centrifugal Pumps*

NEW INCORPORATIONS

Wishek Concrete Products & Lumber Co., Wishek, N. D., has been incorporated with $50,000 capitalization. The directors of the company are Max A., Max, Jr., and V. H. Wishek, all of Ashley, N. D., and L. M. Wishek and Lillian Dempsey of Wishek, N. D.

Vern Mitchell Quarry Co., St. Louis, Mo., has been incorporated by W. H. Dahman, H. S. Cook and J. J. Howard. Capital stock consists of 25,000 common shares at $1 par value, 250 preferred shares at $100 par value, and $500 authorized capital.

Portland Quartzite Co., Inc., Waterloo, Wis., was recently incorporated by Allen C. Wehenn, Oak Park, Ill., with 13,500 shares of common stock, $10 par value, and a minimum capital of $1000. Robert F. Meitner is resident agent.

Delavan Sand & Gravel Co., Inc., Delavan, Wis., has been incorporated with an authorized capital of 500 shares of common stock, no par value. The incorporator is Alois Zale, and the registered agent, G. A. Zale.

Western Sand and Rock, Tucson, Ariz., has been incorporated with $100,000 in capital stock. The incorporators are Joseph H. Thorbecke and Joseph D. O'Leary. John F. Sullivan is statutory agent.

Duffek Sand & Gravel, Inc., Antigo, Wis., has been incorporated with 750 shares of stock, $100 par value, and a $500 minimum capital. The incorporators are Anton and Paul Duffek.

Kent Concrete Products Co., Inc., Kent, Wash., has been incorporated by John E. Hilliker, Lawrence Rupert and Mildred E. Sedler. Capitalization consists of $50,000.

West Side Sand and Gravel Co., Cleveland, Ohio, has been incorporated by D. Rusk Havenfield, with 250 shares of no-par common stock.

Sand & Gravel Products Co., Cleveland, Ohio, has been incorporated by Phillip Novitch. Capitalization consists of 250 shares of no-par common stock.

Bexar Concrete Co., Inc., San Antonio, Texas, has been incorporated with $1000. Charles M., Charles G., and Wilbur B. Schoenfeld are the incorporators.

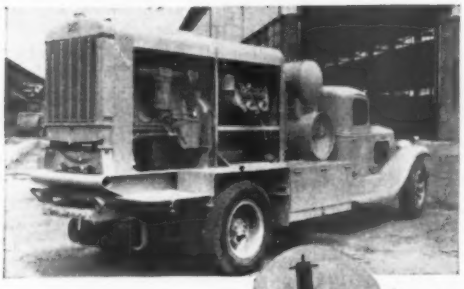
Sweeney Sand & Gravel Corp., Milwaukee, Wis., was recently incorporated by Samuel Goldenburg. Authorized capital consists of 200 shares of common stock of $100 par value.

One-Concrete, Inc., Wichita, Kan., has been incorporated with $15,000 authorized capitalization. Thomas C. Raum is resident agent.

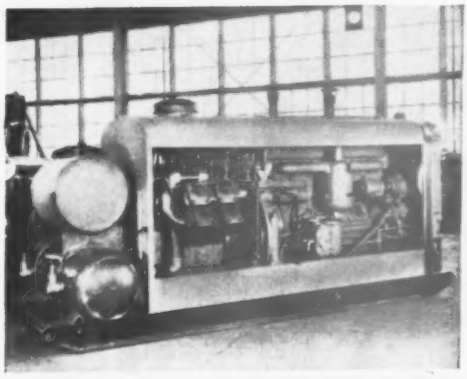
Neelley Ready Mix Concrete, Inc., Waco, Texas, has been dissolved, as announced by the office of the Secretary of State, Austin, Texas.

"AIR POWER" by MURPHY DIESEL

rugged, reliable, responsive



GARDNER-DENVER truck mounted compressor powered by a Murphy Diesel.



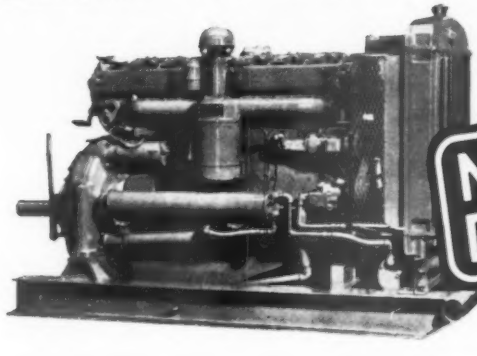
INGERSOLL-RAND semi-portable compressor powered by a Murphy Diesel.

JAEGER portable powered by a Murphy Diesel.

JOY stationary compressor powered by a Murphy Diesel.

LE ROI portable compressor powered by a Murphy Diesel.

WORTHINGTON portable compressor powered by a Murphy Diesel.



MURPHY DIESEL

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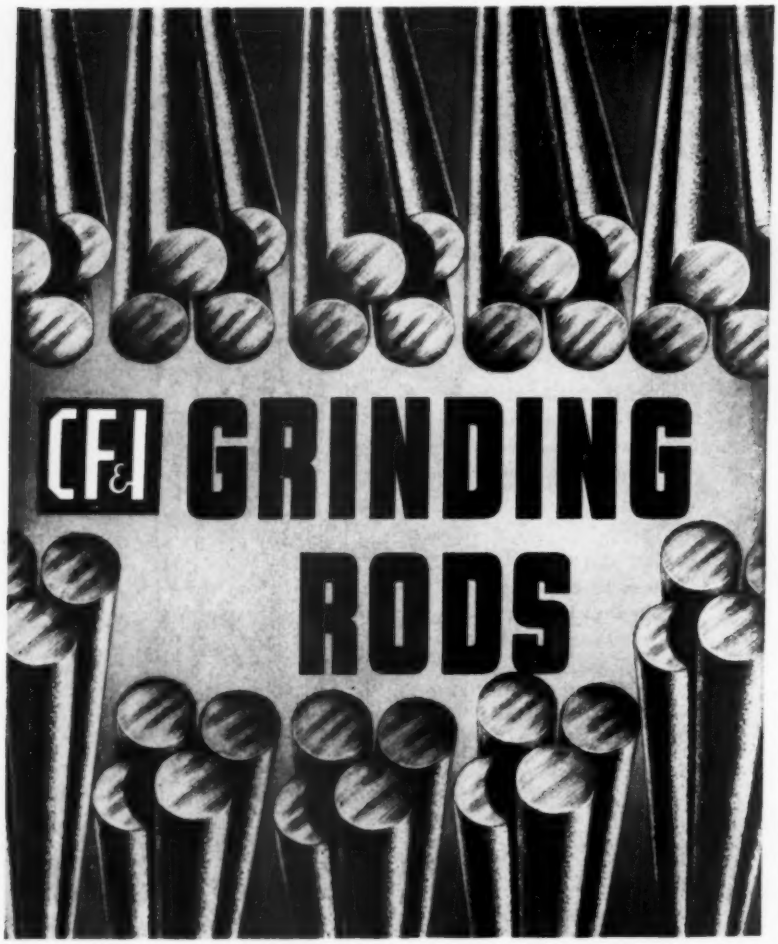
5315 W. Burnham St. Milwaukee 14, Wisconsin

254 A

Heavy duty power

Murphy Diesel engines and power units are available in sizes from 90 to 240 H.P. Engine speeds are 1200 and 1400 rpm. Also available are dual-fuel engines, crude oil burning engines and altitude engines which will maintain sea level ratings up to 9000 ft. "Packaged" generating units are available with capacities ranging from 60 to 154 K.W. A.C. or D.C. voltages to suit your requirements.



wear evenly...resist abrasion

CF&I Grinding Rods are rolled from special analysis steel for more efficient, economical grinding. The CF&I Pueblo Plant maintains strict quality control, from ore to the finished steel product, to assure a grinding medium of top performance and value.

CF&I Steel Products for the Sand and Gravel Industry

Cal-Wic Industrial Screens **Wickwire Rope**
Grinding Balls **Light Rails and Accessories**

THE COLORADO FUEL AND IRON CORPORATION, Denver and New York
PACIFIC COAST DIVISION, Oakland

CF&I
GRINDING RODS
THE COLORADO FUEL AND IRON CORPORATION

1788

MANUFACTURERS NEWS

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that William J. Klein, manager of the Minneapolis branch of the tractor division, has been named vice-president and general sales manager of the division. Mr. Klein joined the company in 1928 as a salesman in Sioux Falls, S. D., branch, later becoming a blockman in the northwestern part of South Dakota. In 1929 he was appointed special factory representative and one year later was made manager of the Minneapolis branch. Mr. Klein is president of the Minnesota chapter of the Soil Conservation Society of America and also is a past president and a member of the board of directors of the Northwest Farm Equipment Association. He was a member and chairman of the agricultural committee of the Minneapolis Chamber of Commerce.

William J. Klein

Nordberg Mfg. Co., Milwaukee, Wis., has announced the appointment of Jack B. Bond as assistant general manager of the crusher, screen and process machinery division in addition to his duties as sales manager of the division. Howard M. Zoerb, formerly administrative manager, has been named divisional consulting engineer. He succeeds Oscar Gruender who has retired. Mr. Bond joined the company in 1944 as sales engineer and in 1949 was appointed district manager of the central territory of the division, becoming division sales manager in 1951. Mr. Zoerb has served Nordberg in an engineering capacity for over 30 years as draftsman, plant engineer, test engineer, division chief engineer, and division administrative manager.

Jack B. Bond

Howard M. Zoerb

Besser Mfg. Co., Alpena, Mich., according to J. Besser, president, has released plans for a new training program at Alpena. The company has purchased a 16-acre tract on which it is proposed to establish a block manufacturing plant which will be used in an educational program for block producers who now operate or contemplate installing and using Besser equipment. The plan also includes classroom studies for technical training and discussions. The course cov-

The muck pile tells the story of Alternate Velocity Loading

IF YOU want the breakage this Pennsylvania quarry got, then try Alternate Velocity Loading with an alternate ROCKMASTER® pattern. This newest ROCKMASTER development has produced improved results in many quarries and it holds possibilities for mining and construction blasting.

In this blast, alternate holes were loaded with low velocity and high velocity charges. The faster millisecond delay caps fired the low velocity holes, putting the rock under maximum stress before shattering. This permitted the sharp punch of the second delay to penetrate further into the burden. The result was better breakage . . . a muck pile that is easy to dig. All holes were initiated from the bottom to prolong confinement of the blast . . . giving maximum results from Alternate Velocity Loading.

For complete details, see your Atlas representative or write to our Technical Division.

BLAST DATA:

Number of holes	11
Average depth	91′
Height of face	85′
Spacing	14′
Burden	27′
ROCKMASTER delays	1 to 6
Total explosives	11,400 lb. (Apex #2 LV and #4 HV)
Rock produced	34,170 Tons
Powder factor	3
Loading started	7:15 AM
Loading finished	10:15 AM
Blast fired	11:15 AM

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY,
WILMINGTON 99, DELAWARE

Offices in principal cities

More Tonnage

"Cape Ann"
Forged
Steel Drop Ball

Ruggedly designed and drop tested to insure maximum breakage. Lifting link protected by deep recess to minimize cable replacement. Adaptable for swivel or shackle.

Used by leading quarries for *economical secondary breakage.*

2000 to 8000 lbs.

Prompt Shipments

For further information write—

Cape Ann Anchor & Forge Co.
Post Office Box 360
Gloucester, Mass.

ers one month and participants may enroll for the full course or such part of the training program as desired. A news letter "A Challenge and a Program for the Block Industry"' will be distributed monthly to the concrete block industry and trade journals. Purpose of the paper, Mr. Besser said, is to present technical and business problems, together with their solutions, manufacturing trends and discussion forums.

Atlas Powder Co., Wilmington, Del., has announced the election of D. J. C. Copps as vice-president in charge of the explosives, industrial finishes and engineering departments. He is also

D. J. C. Copps

W. Clayton Lytle

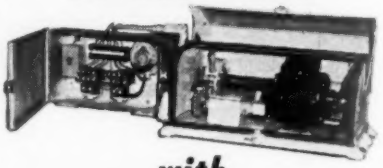
a director and member of the executive committee. W. Clayton Lytle, who has been serving as manager of the explosives research division, succeeds Mr. Copps as general manager of the explosives department.

Goodman Mfg. Co., Chicago, Ill., has acquired from Diamond Iron Works, Minneapolis, Minn., its line of crushing, screening and handling equipment. Operating as Diamond Iron Works, division of Goodman Mfg. Co., manufacture of this equipment has been transferred to the main plant in Chicago, Ill. Key personnel of Diamond concerned directly with sales, engineering and service have been retained under the direction of Carl E. Hanson, sales manager, and W. Eckley, chief engineer, with headquarters in Chicago.

Gramm Trailer Corp., Lima, Ohio, announces that Jack Bernard has been made coordinator of regional activities in the New York office and that the following sales representatives have been appointed: Jack Rensel, Philadelphia, Penn., in eastern Pennsylvania, New Jersey, Maryland and Virginia; William Monroe, Lima, Ohio, in western Pennsylvania, Ohio, West Virginia and Kentucky; Nathan Goldberg, Boston, Mass., in New England and New York State areas; Marvin Oakes, Atlanta, Ga., in the southeastern states; and Roger M. Stienecker, Chicago, Ill., from local sales to regional manager in charge of Midwestern states.

General Electric Co., Syracuse, N.Y., announces the appointment of I. M. Ellis as regional manager for the West Coast, with headquarters at San Francisco. He succeeds L. R. Sheeley, who was recently transferred to Syracuse, N.Y., as manager of sales. G. F. Reed has been named regional manager at Detroit, Mich.,

CONTROLLED SAMPLING



with

GEARY-JENNINGS

Geary-Jennings Sampler is as dependable in operation as it is right in principle. Handles wet or dry materials with controlled variable speeds and length of intervals. Its shielded mechanism is electrically operated. The Geary-Jennings is widely used by both producers and consumers of Rock Products. They count on this rugged machine for true samples, provided at low cost.

Write today for the details.

Leaders in Experience & Service

THE GALIGHER CO.
HOME OFFICE: 545 West 8th So., P.O. Box 209
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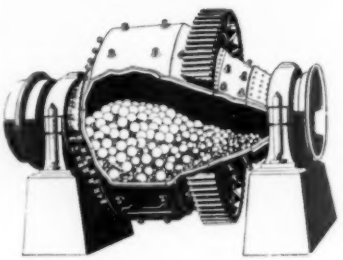
GRINDING MILLS



- CONICAL MILLS
- TRICONE MILLS
- ROD MILLS
- CYLINDRICAL MILLS
- TUBE MILLS
- BATCH MILLS

Write for Bulletin AH-440-7

HARDINGE
COMPANY, INCORPORATED
YORK, PENNSYLVANIA · 240 Arch St. · Main Office and Works
New York · Toronto · Chicago · Hibbing · Houston · Salt Lake City · San Francisco

See them now!

NEW FORD T-800
Tandem-Axle BIG JOB.
New 170-h.p. *Cargo King*
V-8. New Power Steering
standard.

New FORD TRUCKS for '54

featuring TRIPLE ECONOMY

Big new savings in the 3 most important truck saving areas

1. NEW Gas-Saving, Low-FRICTION, Overhead-Valve, High-Compression, Deep-Block Engines in all Models!

Now, you get a gas-saving LOW-FRICTION engine in *any* Ford Truck you choose—from 115- to 170-h.p.! New short-stroke design cuts internal friction loss up to 33%, liberates up to 23% more *usable* power.

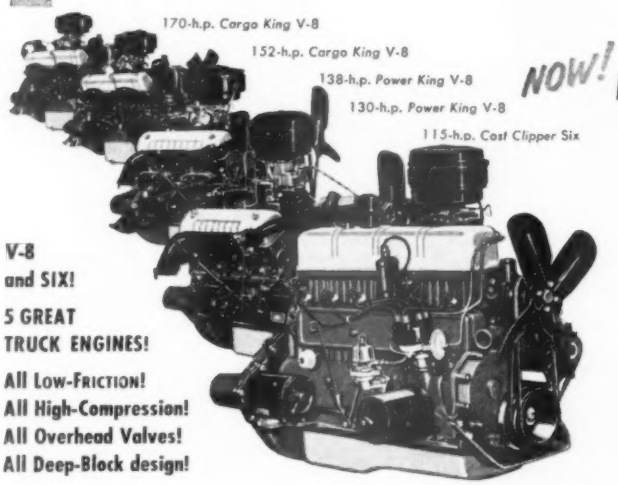
2. NEW Driverized Cabs! NEW Power Steering! NEW Power Brakes! Fully Automatic Fordomatic Drive!

Ford's 3-man Driverized Cabs cut fatigue! New *Master-Guide Power Steering* standard on T-800 Series, optional on most other BIG JOBS, Power Braking* for ½-ton, Fordomatic* for all light duty models!

3. NEW Money-Saving Capacities! Over 220 Models! New 6-wheelers! The one right truck for your job!

Ford's expanded new truck lines include brand-new Ford Tandem-Axle BIG JOBS, up to 60,000 lbs. G.C.W., and two more giant new Ford Cab Forward BIG JOBS rated up to 55,000-lbs. G.C.W.!

*Available at extra cost.



V-8 and SIX!

5 GREAT TRUCK ENGINES!

All LOW-FRICTION!
All High-Compression!
All Overhead Valves!
All Deep-Block design!

NOW! **Mightiest concentration of power per cubic inch ever built into any truck engine line! Only FORD has it!**

For the power they develop, Ford's new truck engines have *less cubic inch displacement* than any other truck engine line. The Ford 317 cu. in. *Cargo King* V-8 develops its 170-h.p. from as much as 96 cubic inches less displacement. Smaller-displacement engines normally need less gas! That's why Ford *concentrated power* is a big factor in new Ford Truck *TRIPLE ECONOMY!*

MODERNIZE YOUR PLANT with
Cedarapids-Schrock MOTORIZED HEAD PULLEYS

Here's a plant *modernized* with Motorized Head Pulleys that cut conveyor downtime up to 90% because all moving parts are inside the pulley shell! You save labor, too. On the installation shown at the left, the control switch enables the truck driver to pull up and load his own truck simply by pressing the button.

HUNDREDS OF INDUSTRIES ARE REDUCING CONVEYOR DOWNTIME 70% to 90%

• NOW you can eliminate maintenance headaches on your belt or belt-bucket conveyor installations. With Cedarapids-Schrock Motorized Head Pulleys there are no chains, sprockets, sheaves out in the weather and dirt, no chain idlers to keep adjusted and oiled, no V-belts to adjust or replace, no shafts and drives to service or lubricate. *There is no other pulley like it!*

The next time you're down for weather, between jobs, or shut down for any reason, provide for future cuts in maintenance costs by modernizing your plant with *Motorized* Head Pulleys. Your Cedarapids distributor can give you the money-saving details.

Built for sale in Arizona, California, Nevada, New Mexico, Southern Oregon, Southwestern Utah and Texas by

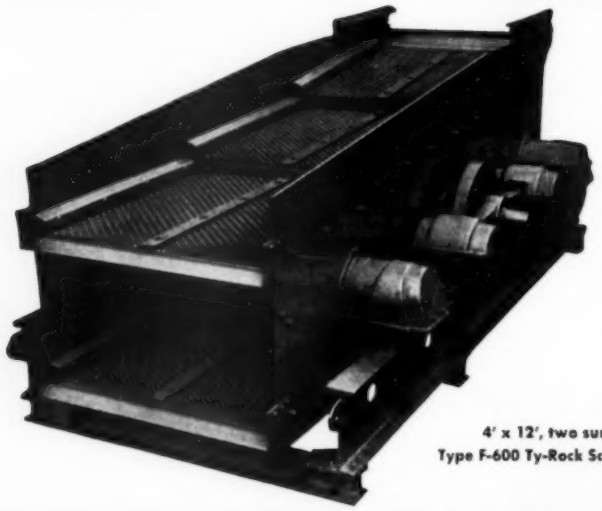
YUBA MANUFACTURING CO. (Pulley and Sprocket Dept.) **Benicia, California**

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa, U.S.A.

YOU CAN DEPEND ON

TY-ROCK SCREENS

BALANCED RUGGED



4' x 12', two surface
Type F-600 Ty-Rock Screen

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

succeeding R. L. Casselberry, recently transferred to Syracuse as manager of product planning and marketing research. G. P. Foster has been made regional manager for the Midwest, with headquarters at Chicago, Ill. He succeeds H. N. McNeill, who was transferred to Syracuse as manager of product service.

LeTourneau-Westinghouse Co., subsidiary of Westinghouse Air Brake Co., Peoria, Ill., announces that W. E. Hendricks, assistant to the general sales manager, has been appointed domestic sales manager. He succeeds

Lloyd Rager

W. E. Hendricks

H. R. Powers, who has resigned. Lloyd Rager, assistant advertising manager for the past four years, has been named sales promotion manager.

Eugene Engineering Co., Eugene, Ore., manufacturer of EECO rock drills, has appointed the following distributors: Wheeler-Kershaw Co., Salt Lake City; Colorado Builders' Supply Co., Denver and Casper, Wyo.; Westmont Tractor & Equipment Co., Missoula and Kalispell, Mont.; Seitz Machinery Co., Inc., Billings and Great Falls, Mont.; Intermountain Equipment Co., Boise, Idaho and Spokane, Wash.; Western Machinery Co., Phoenix; R. L. Harrison Co., Albuquerque, N. M.; Pacific Hoist & Derrick Co., Seattle and Puyallup, Wash.; Cascade Equipment Co., Eugene, Ore.; Smith Booth Usher Co., Los Angeles, Calif.; and Northern Commercial Co., Alaska and the Yukon.

The Torrington Co., Torrington, Conn., has announced the election of Walter C. Thompson as president of the company to succeed Lester J. Ross, who passed away November 14. Ray B. Nichols has been elected executive vice-president to succeed Mr. Thompson. N. Russell Clarke, president of the Westfield Mfg. Co., a subsidiary, has been elected director for the unexpired term of Mr. Ross, and Byron T. Virtue, chief engineer of the bearing division, has been promoted to general sales manager.

Construction Industry Manufacturers Association, Inc., Chicago, Ill., has announced election of the following officers for 1954: Frederick Salditt, Harnischfeger Corp., president; Gail E. Spain, Caterpillar Tractor Co., 1st vice-president; Kenneth Lindsay, Iowa Mfg. Co., 2nd vice-president; and I. W. Lloyd, The Ohio Oil Co., secretary-treasurer. Harold F. Hess is executive vice-president.

New directors elected to a three-year term are B. F. Devine, Chain

This chain WON'T break

Here are chains especially designed for bucket elevator service that properly applied, *will not break!*

Rex Chabelco® S-856 and S-858 Steel Chains may *wear* out after long, tough service, BUT they won't break. And, you'll be able to free men for other important tasks...not have them on continuous elevator maintenance work. You'll get greater production...eliminate chain replacement costs.

These elevator chains have extra-large bearing areas in contrast to other types of chain used in this demanding service. They will outlast...outwear any other chain because they are built for bucket elevators.

Defeat chain breakage and all the extra cost it causes you by standardizing on Rex Chabelco S-856 and S-858 Chains for your bucket elevators. Your Chain Belt Field Sales Engineer will be happy to give you the complete story. Or, mail the coupon.

CHAIN BELT COMPANY

District Sales Offices and Distributors in all principal cities

CHAIN BELT COMPANY 54-113
4649 W. Greenfield Ave.,
Milwaukee 1, Wis.

I want the story on Rex Chabelco S-856 and S-858 Chains. Send me my copy of Bulletin No. 52-53.

Name.....

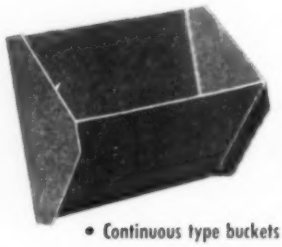
Company.....

Address.....

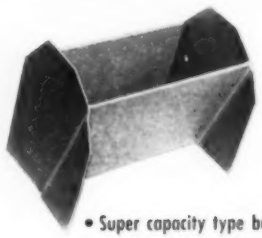
City.....*Zone*....*State*.....

RUGGED AND DEPENDABLE AT low cost

• Salem type buckets



• Continuous type buckets



• Super capacity type buckets

Standard high quality steel elevator buckets are available in all styles, types, sizes and gauges for replacement as well as new installations. For real economy and immediate service, get acquainted with the Standard line today.

The Standard Metal Mfg. Co. SINCE 1921

Write for new catalog showing the complete line of Standard buckets and prices.

STANDARD METAL MFG. CO.
110 Center St., Malinta, Ohio

Belt Co.; Kenneth Lindsay, Iowa Mfg. Co.; W. A. Nugent, Thor Power Tool Co.; Frederick Salditt, Harnischfeger Corp.; Gail E. Spain, Caterpillar Tractor Co.; Julien R. Steelman, Koehring Co.; and F. J. Whelan, Worthington Corp.

Directors whose terms expire in 1956 are E. F. Bentley, Detroit Diesel Engine Division, G.M.C.; J. H. Birckhead, Bucyrus-Erie Co.; O. J. Ellertson, Pioneer Engineering Works, Inc.; Arthur A. Levison, Blaw-Knox Equipment Div. of Blaw-Knox Co.; Ray McLean, The Jaeger Machine Co.; Luke E. Smith, "Quick Way" Truck Shovel Co.; and W. McK. White, Sr., White Mfg. Co.

Directors whose terms expire in 1955 are W. B. Greene, Barber-Greene Co.; I. W. Lloyd, The Ohio Oil Co.; J. G. Miller, The Baker Mfg. Co.; Robert C. Myers, United States Steel Corp.; Ralph K. Stiles, Austin-Western Co.; Boyd S. Oberlink, Tractor Division, Allis-Chalmers Mfg. Co.; and Chauncey B. Smythe, The Thew Shovel Co.

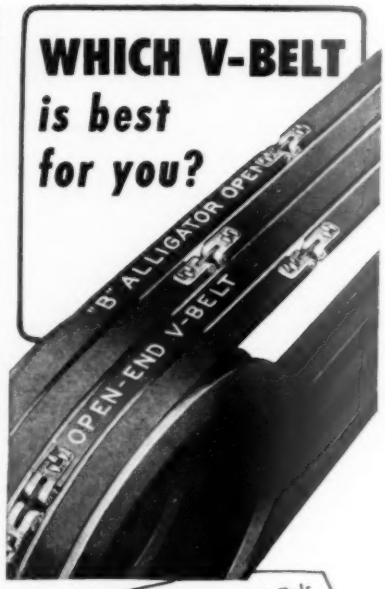
Jackson & Church Co., Saginaw, Mich., has announced the appointment of H. E. Casey as sales manager of the Calsi-crete Corp., a division of the company. Paul C. Horton has been named chemical engineer. Calsi-crete, a hydrous calcium silicate building material which is said to have insulating, load-bearing, acoustical and water-resisting qualities, was developed in Europe and recently introduced in the United States. Calsi-crete Corp. is now issuing franchises for manufacture of the material.

Gar Wood Industries, Inc., Detroit, Mich., has organized the Mattoon division to handle the production of bulldozers and scrapers sold through Allis-Chalmers industrial tractor distributors. Hunter Dietz, formerly plant manager at Mattoon, Ill., has been appointed Mattoon division manager. Dave Davis, formerly assistant sales manager of the Findlay division, has been named tractor equipment sales manager, and Arthur C. Evans has been appointed chief engineer, tractor equipment.

The Euclid Division, General Motors Corp., Cleveland, Ohio, announces the appointment of W. P. Sutherland as district manager of the territory comprising Illinois, Wisconsin, three northeastern Indiana counties, and the eastern half of Missouri, with headquarters in Chicago. W. R. Brown, district representative, succeeds Mr. Sutherland in Minnesota and the Upper Peninsula of Michigan outside the Iron Range.

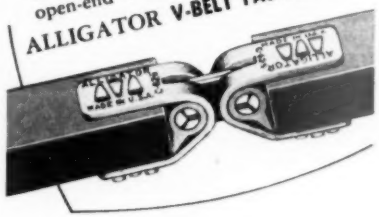
Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich., announces that Bart W. Patrick, formerly sales representative in Oregon and Washington, has been appointed sales representative in New England. He succeeds Leslie Southgate who has been given a new assignment in the industrial sales department in Detroit. J. T. Hanna, formerly service repre-

WHICH V-BELT is best for you?



If the correct size of endless V-Belt is not readily available, or if you have to tear down machinery to install, then the best belt to use is open-end V-Belting fastened with

ALLIGATOR V-BELT FASTENERS



★ In this way you can make up V-Belts in *any length* to fit *any drive* the fast economical way — V-Belts that perform exceptionally well.

★ In contrast to link-type belts these ALLIGATOR fastened V-Belts have just *one* strong joint . . . *stretch and follow-up maintenance are reduced to a minimum.*

ALLIGATOR INTRODUCTORY V-BELT DRIVE UNITS contain V-Belting, Fasteners and Tools — everything you need in one compact package to make up V-Belts quickly. Available in sizes A, B, C & D.

Ask for Bulletins V-215 and V-216
Order From Your Distributor

FLEXIBLE STEEL LACING COMPANY
4684 Lexington Street, Chicago 44, Illinois

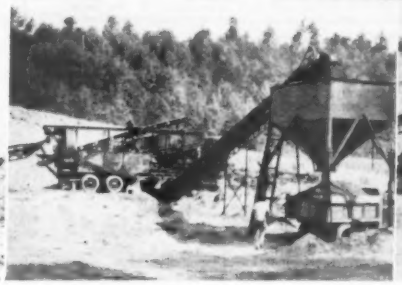
ALLIGATOR V-BELT FASTENERS

Compare...Then you'll specify AUSTIN-WESTERN for your crushing and screening plant!

HERE ARE A FEW TYPICAL REASONS WHY IT WILL PAY YOU TO **COMPARE** BEFORE YOU BUY!

COMPARE ...	A-W	Make "X"	Make "Y"	Make "Z"
Steel plate crusher frame for high strength without weight of cast steel frame.	Yes	No	Yes	No
Machined steel toggle plate for absolute protection instead of cast iron	Yes	No	No	No
Inclined positive-throw type vibrating screen	Yes	Yes	No	Yes
Dustproof and watertight brakes on outside of wheels	Yes	No	Yes	No
All bearings of anti-friction type	Yes	Yes	Yes	Yes
Single source for wide range of complete stationary or portable plants, crushers, matching screens, elevators, conveyors and bins	Yes	Yes	No	No
TOTAL	100%	50%	50%	33⅓%

"61" compact, lightweight and readily portable. Designed for low cost, fast output where extreme accuracy to size is not required.



"101" Newly designed plant with 10" x 36" roller bearing jaw crusher, 30" x 20" roller bearing roll crusher, 30" conveyors and 4' x 12' inclined positive throw type screen.

"201" New Austin-Western plant to produce especially large amounts of ¾" and smaller product. 10" x 24" jaw crusher, 24" x 16" roll crusher; 3' x 10' vibrating screen, and 24" conveyors.

Before you buy any crushing and screening plant, we urge you to *compare* carefully specific design and construction features. If you do so, we are confident that you will prove conclusively that Austin-Western plants are designed and constructed to out-perform and outlast all other makes.

● *For detailed information about any of these points or copies of our latest catalogs, please write: Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio, or distributor nearest you.*

DISTRIBUTORS IN ALL PRINCIPAL CITIES OF THE WORLD

Austin-Western
CRUSHING, SCREENING and WASHING EQUIPMENT

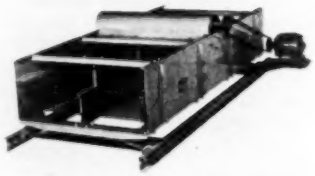
BALDWIN BLH LIMA-HAMILTON
Construction Equipment Division

BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

ALL-OVER VIBRATION

GIVES THE UNIVERSAL ITS SUPERIORITY IN HANDLING TOUGH SCREENING JOBS!

From feed to discharge end, every inch of the screening surface of a UNIVERSAL Screen has exactly the same intensity of vibration. That's important when you're running seasonably damp material!



IN 35 YEARS OF SERVICE TO INDUSTRY UNIVERSAL SCREENS ARE WELL-KNOWN FOR GIVING REAL SATISFACTION AND ECONOMY TO PLANT OPERATORS EVERYWHERE. PRICES OF LATEST MODELS MAKE UP-TO-DATE, QUALITY SCREENING AVAILABLE TO ALL!

Get the facts today—write for free literature on Screens and Screening!

UNIVERSAL VIBRATING *SCREEN CO.*

RACINE — — WISCONSIN

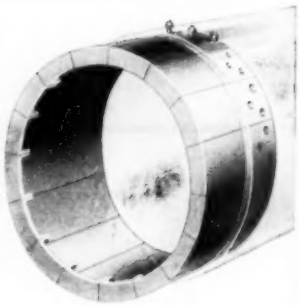
PYRASTEEL

SEGMENTAL KILN ENDS FOR CEMENT PLANTS
. . proven satisfactory in THOUSANDS of Installations

Avoid burnouts and shutdowns, and insure years of continuous service, by equipping your kilns, both feed and discharge ends, with PYRASTEEL Segmental Kiln Ends.

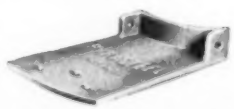
PYRASTEEL is equally effective and economical in many other high-heat applications, including clinker coolers, conveyor screws, feed pipes, and drag chains.

Over three-quarters of the annual cement output is produced in plants using either or both of our alloys, PYRASTEEL and EVANSTEEL.



PYRASTEEL KILN END, Discharge end

Unit Segments are easy to install or replace



Write for PYRASTEEL Bulletin

CHICAGO STEEL FOUNDRY CO.

Kedzie Avenue and 37th Street • Chicago 32, Illinois

Makers of Alloy Steel for Over 40 Years

sentative, has been made sales representative in Oregon and Washington. Harold J. Vaughn of the service training department in Detroit, succeeds him as service representative.

Thew Shovel Co., Lorain, Ohio, announces the election of E. E. Esgate as a vice-president of the company. He joined the firm in 1949 as assistant to the general manager and has been active in all phases of operation since that time.

Thor Power Tool Co., Aurora, Ill., announces that John L. MacDonald, formerly Boston district industrial tool service engineer, has been appointed manager of the Newark, N. J., factory branch office.

Robertshaw-Fulton Controls Co., Philadelphia, Penn., has announced the appointment of Lee E. Cuckler as manager of the engineering department of the Fielden instrument division.

Atlas Powder Co., Wilmington, Del., announces that Ralph K. Gottshall, president, has been elected a life trustee of Lafayette College, from which he graduated, magna cum laude, in 1927, with a B.S. in chemistry.

Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Lima, Ohio, has appointed the McNall Machinery & Supply Corp., Cedar Rapids, Iowa, as distributor in central and eastern Iowa.

Hammond Bag & Paper Co., Wellsburg, W. Va., announces that Mason E. Lee has been appointed district sales representative in Alabama, Mississippi and Louisiana. He was formerly associated with Bemis Bro. Bag Co.

First Machinery Corp., New York, N.Y., announces the appointment of Milton Rabinowitz as vice-president and general manager. Expansion of the engineering staff and facilities of the new and used equipment departments has also been announced.

Chase Bag Co., Chicago, Ill., has appointed James W. Jacoby as technical service representative of the Philadelphia branch. He was formerly a member of the laboratory staff of the research department in Chagrin Falls, Ohio.

Western Machinery Co., San Francisco, Calif., has appointed William H. Newton as general sales manager of the WEMCO division. He was formerly associated with the Jeffrey Mfg. Co.

Linatex Corp. of America, Rockville, Conn., has announced the election of Ashworth N. Stull to the board of directors.

Zonolite Co., Chicago, Ill., announces the appointment of Harry M. Dixon as sales engineer in the Z-Crete division.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed J. P. Waite, Inc., Milwaukee, Wis., as distributor in Wisconsin and Upper Michigan.

BEFORE

AFTER

Rebuilt 3 Times with MANGA-TONE N.M. and RESISTO-LOY

These are actual undoctored photographs of a four foot Mantle Liner which has been rebuilt and resurfaced the THIRD TIME with MANGA-TONE N.M. and RESISTO-LOY.

Notice how badly worn the liner was and how perfectly this job was finished.

This is a sample of the results obtainable through the use of MANGA-TONE N.M. and RESISTO-LOY. Could you ask for any more convincing proof of economy?

You can benefit by similar savings by calling in our field man for he is a real specialist in this work.

RESISTO-LOY CO. *Manufacturers,* Grand Rapids 7, Michigan

Always insist on genuine

BLAW-KNOX REPAIR PARTS

- cut clamshell maintenance costs
- reduce costly downtime
- prolong bucket life

BLAW-KNOX repair parts are especially designed to fit your Blaw-Knox Clamshell. They contain *all* the carefully engineered features of the original parts to assure the efficient operation, low maintenance and long life you expect from Blaw-Knox products.

There's no need to use a costly "mongrel" bucket . . . always insist on genuine, factory-built repair parts. Write for a parts book today, if you don't have one, giving the serial number of your bucket.

Get this "Bucket Saver" booklet

It's the only booklet available with a bucket-saver list of "do's" and dont's on clamshell use and abuse. It illustrates reeving methods that improve bucket performance. It gives complete details on bucket repair. It contains 40 pages of usable information. Write for Bulletin 2373 today!

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
2035 FARMERS BANK BLDG.
PITTSBURGH 22, PA.
Offices in Principal Cities

PHONE . . . WIRE . . . WRITE . . . YOUR **BLAW-KNOX** DISTRIBUTOR

"ORIENTED DIAMONDS"
MAKE SPRAGUE & HENWOOD BITS
CUT FASTER—LAST LONGER

Always a leader in its field, Sprague & Henwood, Inc. PIONEERED the development of ORIENTED Diamond Bits; in which each individual diamond is set with its hardest rib or "vector" toward the work.

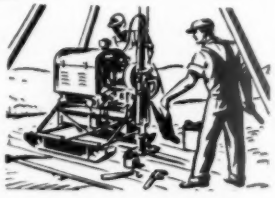
As of the present date we have produced more than FIVE THOUSAND oriented bits, in a wide variety of types and sizes, with both cast and powdered-metal matrices; and have proved, by extensive comparative tests in our own contract drilling operations, that they cut much faster and last much longer than bits in which the diamonds are set at random.

Only selected diamonds of certain crystaline structure can be used and only specially trained and equipped setters of more than usual aptitude can be relied upon to orient diamonds correctly in the mold, but we are now fully organized for efficient production of ORIENTED DIAMOND BITS, at no additional cost to the purchaser.

In terms of footage cost, these are the most economical diamond bits ever produced and we invite inquiries on that basis. Bulletin No. 320 illustrates and describes all types and gives complete data.

CONTRACT DRILLING

We do drilling by contract and are one of the oldest and largest contractors for any type of core drilling. Experienced crews and supervisors are available for service anywhere in the United States and many other countries. Estimates on request.



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___Aftercoolers, Air
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___Bags
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___Batchers
___Belting, Conveyor, Elevator, Power Transmission
___Belting, V-type
___Belt Repair Equipment
___Bin Level Indicators
___Bins and Batching Equipment
___Bits
___Blasting Supplies
___Block Machines, Concrete Building
___Bodies, Trailer
___Brick Machines and Molds
___Buckets
___Bulk Cement Handling Equipment
___Bulldozers
___Cars, Industrial
___Central Mixing Plants
___Classifiers
___Clutches
___Coal Pulverizing Equipment
___Concentrating Tables
___Concrete Forms
___Concrete Mixers
___Concrete Mixing Plants
___Concrete Specialty Molds
___Concrete Waterproofing and Dampproofing
___Conveyors
___Crushers
___Coolers
___Cranes
___Curing Equipment
___Derricks
___Dewatering Equipment, Sand
___Diesel Engines
___Dragline Cableway Excavators
___Draglines
___Dredge Pumps
___Drilling Accessories
___Drills
___Dryers
___Dump Bodies
___Dust Collecting Equipment & Supplies
___Electric Motors
___Engineering Service, Consulting and Designing
___Explosives & Dynamite
___Fans and Blowers
___Feeders
___Fifth Wheel, Heavy Duty Special
___Flotation Equipment
___Front End Loaders
___Gasoline Engines
___Gear Reducers
___Generator Sets
___Grinding Media
___Gypsum Plant Machinery
___Hard Surfacing Materials
___Hoists
___Hoppers
___Kilns: Rotary, Shaft, Vertical
___Locomotives
___Lubricants
___Magnetic Separators
___Masonry Saws
___Mills
___Pipe
___Pumps
___Scales
___Screen Cloth
___Screens
___Scrubbers: Crushed Stone, Gravel
___Shovels, Power
___Speed Reducers
___Tanks, Storage
___Tires and Tubes
___Torque Converters
___Tractor Shovels
___Tractors
___Trailer Dump Bodies
___Trucks, Bulk Cement
___Trucks, Industrial
___Trucks, Mixer Body
___Trucks, Motor
___Valves
___Vibrators
___Welding and Cutting Equipment
___Winches
___Wire Cloth
___Wire Rope

If equipment you are in market for is not listed above, write it in the space below.

_____

_____

_____

Your Name_____ Title_____

Firm Name_____

Street_____

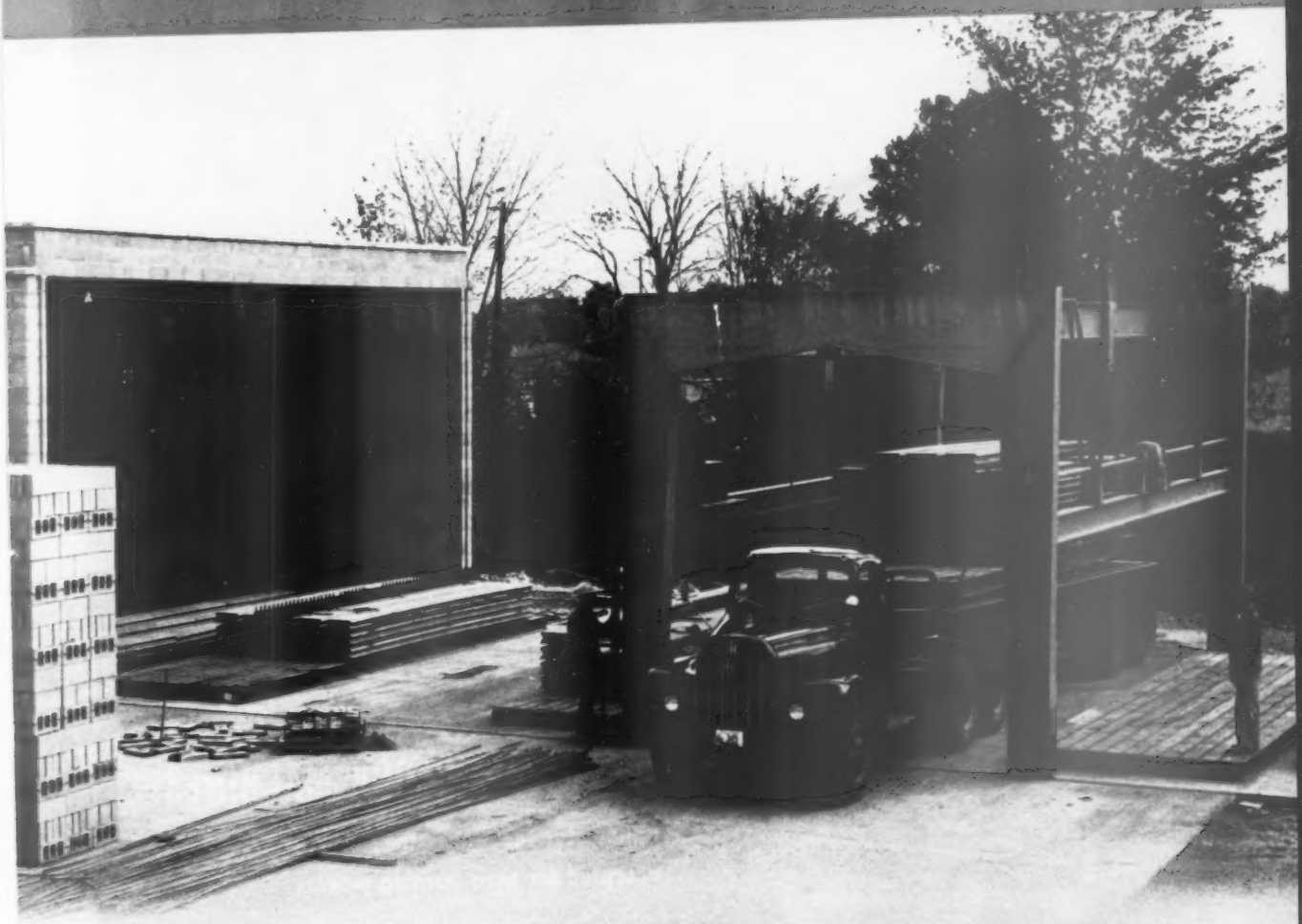
City_____ State_____

RP-2

CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

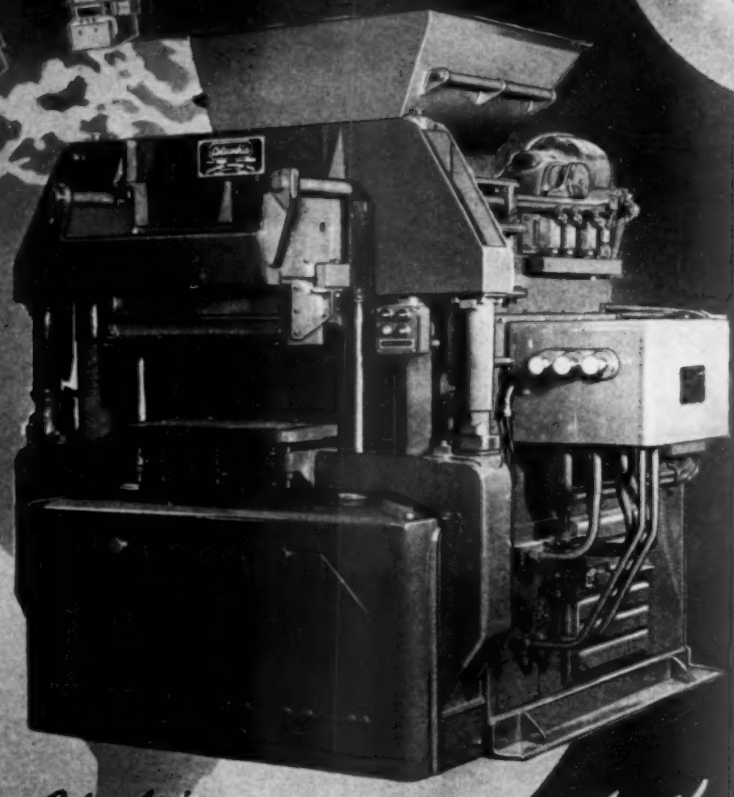
CONCRETE UNITS · READY-MIXED CONCRETE



Loading pallet of Rapidex slabs at plant of Spickelmier Co., Indianapolis, Ind.

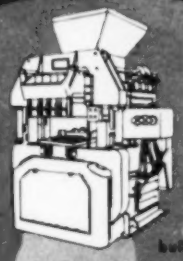
WORLDWIDE ACCEPTANCE

CANADA
HONOLULU
COLUMBIA (S.A.)
BORNEO
PARIS
HAITI
KOREA
WAKE
NOVA SCOTIA

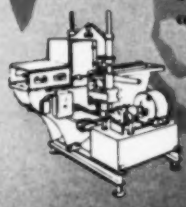


Columbia's MODEL 12
3-BLOCK MACHINE

Now!
Available on lease-purchase or outright sale.



MODEL 8
2-BLOCK
Fully-automatic 2-block machine built to highest standards, competitively priced.



BLOCK SPLITTER
Fully-automatic or semi-automatic.

BATCH MIXERS
12, 25 and 50 cubic foot sizes.

District Offices: Wisconsin, Ohio, South Carolina, Mississippi, Florida, New Jersey, Virginia and California.

Columbia BLOCK MACHINES

...famous for the blocks they produce!

...accepted for their earning power!

Throughout the United States and abroad, Columbia concrete block making equipment is known for its ability to produce highest quality products at an investment which realizes a comfortable margin of profit for their owners—what more can you ask of a production machine?

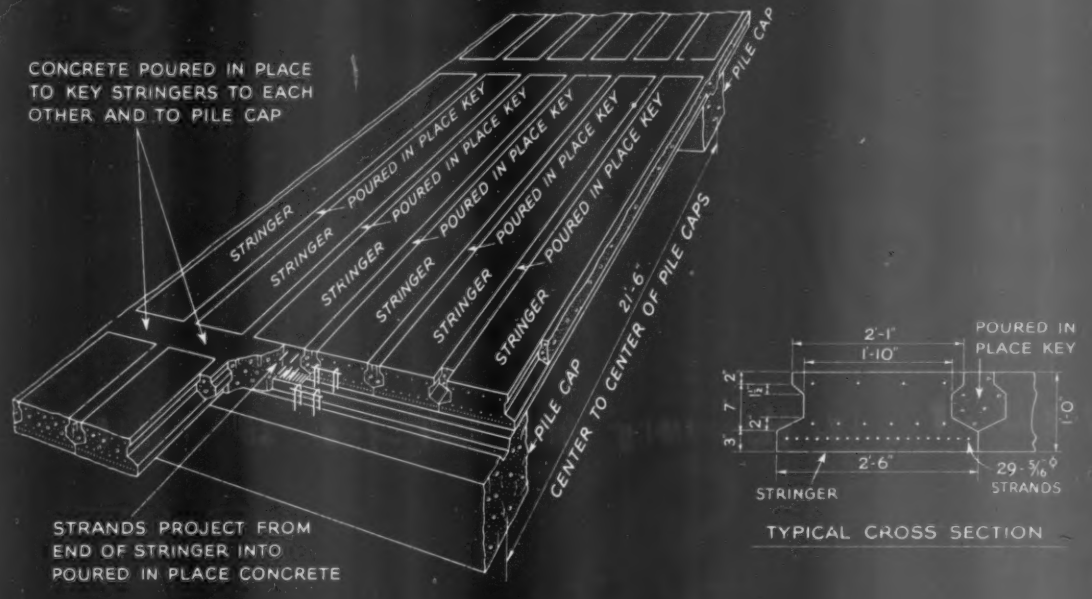
Investigate Columbia's one, two or three-block machines today! Write for free catalog.

Columbia MACHINE

Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON
Factory Branch and Warehouse at Mukwanago, Wisconsin

FOR DEPENDABLE TENSIONING OF PRESTRESSED CONCRETE MEMBERS . . .

ROEBLING WIRE AND STRAND



Pier "C", under construction at Hoboken, N. J. for the Port of New York Authority, is 730 feet long x 350 feet wide. Pile caps which are post-tensioned with Freyssinet type cables of .276" Roebling wire are 21½ feet center to center. Deck is made up of 4500 precast stringers 2½ feet wide, 1 foot deep, 21 feet long. Stringers are pre-tensioned bonded type made with Roebling 5/16" diameter prestressed concrete strand . . . Erection, including fabrication of prestressed concrete members, by J. Rich Steers, Inc., Prestressed concrete details by Freyssinet Company, Inc., both of New York.

IN PRE-TENSIONING, where wire or strand is prestressed between anchorages before the concrete is cast, the prestress is transferred to the concrete through bonding action. For this reason, Roebling high tensile steel wire and strand are so processed as to afford maximum bonding characteristics . . . and this, combined with superior strength, has put Roebling tensioning elements way out front in the rapidly-growing swing to prestressed concrete.

Roebling materials for pre-tensioning were developed to facilitate the fabrication of prestressed concrete members on a standard production basis. This involves fabrication at a central plant where quality and labor practices can be controlled, and costs held to a minimum. Then, as with the Hoboken pier, (illustrated here), the finished members are carried to the construction site and erected directly from the truck.

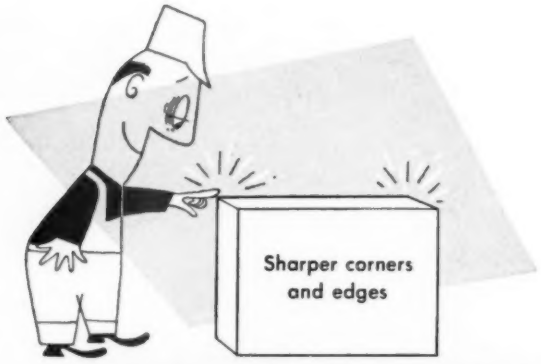
Roebling engineers are always ready to study the designs of prestressed concrete structures and to offer suggestions as to the best tensioning elements for specific applications. John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

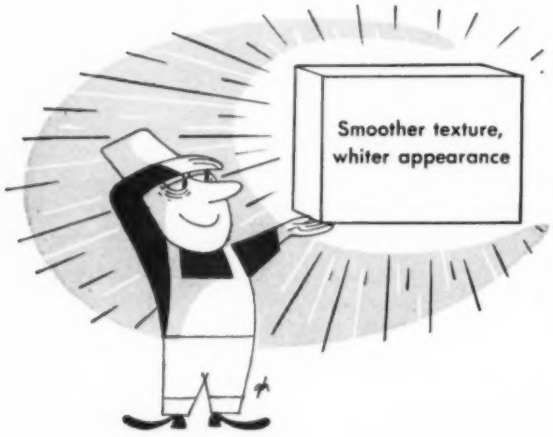
ROEBLING JAR ROEBLING CF&I

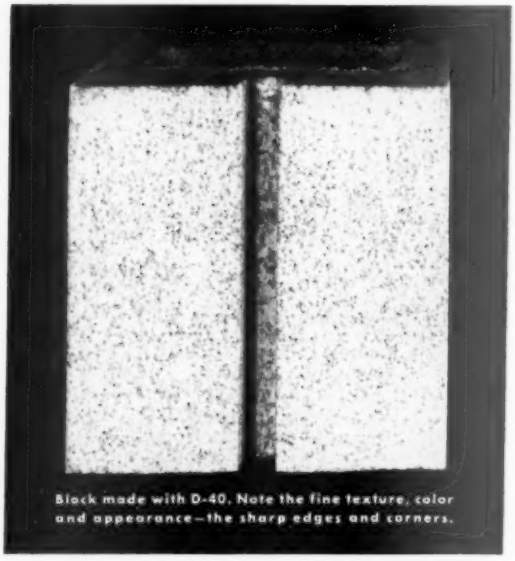
Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE • BOSTON, 51 SLEEPER ST & 5 PITTSBURGH ST • CHICAGO, 5525 W. ROOSEVELT RD • CINCINNATI, 3253 FREDONIA AVE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4901 JACKSON ST • DETROIT, 915 FISHER BLDG • HOUSTON, 6216 NAVIGATION BLVD • LOS ANGELES, 5340 E. HARBOR ST • NEW YORK, 19 RECTOR ST • ODESSA, TEXAS, 1920 E. 2ND ST • PHILADELPHIA, 230 VINE ST • ROCHESTER, 1 FLINT ST • SAN FRANCISCO, 1740 17TH ST • SEATTLE, 900 1ST AVE S. • ST. LOUIS, 3001 DELMAR BLVD • TULSA, 321 N. CHEYENNE ST • EXPORT SALES OFFICE, TRENTON 2, NEW JERSEY

STRONGER concrete blocks






Block made with D-40. Note the fine texture, color and appearance—the sharp edges and corners.

with low-cost D-40

Ask us about the outstanding results concrete block manufacturers are getting by adding one to two ounces of dry, granular D-40 per bag of cement at the mixer. D-40 not only will help you make a greatly superior product but at the same time will reduce your operating costs.

D-40 is a ready-to-use additive supplied in economical 85# bags—available at conveniently located supply points throughout the United States.

Ready-mixed concrete producers have also found D-40 improves their product

ORONITE CHEMICAL COMPANY

For complete information, samples and technical help, write or call the Oronite office nearest you.

ORONITE CHEMICAL COMPANY

38 Sansome St., San Francisco 4, Calif. • Standard Oil Bldg., Los Angeles 15, Calif.
30 Rockefeller Plaza, New York 20, N. Y. • 600 S. Michigan Ave., Chicago 5, Ill.
Mercantile Securities Building, Dallas 1, Texas

2808

INDUSTRY NEWS

Concrete Plant

WAMIX CONCRETE CO., Dallas, Texas, has opened a $125,000 concrete plant at Irving, Texas. The plant, which has a capacity of 80 to 100 cu. yd. of concrete per hour, is under the management of W. E. Boorhem. The plant is located at the site of the Wamix gravel plant on Hunter Farrell Rd. The gravel plant supplies the Irving operation and three other Wamix operations with over 300,000 tons of gravel per year. The company also recently opened a $150,000 concrete plant at Garland, Texas, which is under the management of J. D. Whatley.

Cover Picture

ON THIS MONTH'S COVER of the Concrete Product's section is an illustration of the very efficient facilities at The Spickelmier Co., Indianapolis, Ind., plant devoted to the manufacture of Rapidex, a new prestressed slab. The entirely new plant was built for the manufacture of floor and roof slabs by mass production methods.

Precast Concrete Wall Panels

THE MARIETTA CONCRETE CORP., Marietta, Ohio, recently supplied over 200 insulated, precast concrete wall panels for a new exhibition building at the Ohio State Fairgrounds. The panels were of two basic sizes, 8 x 10 x 5 ft. and 8 x 8 x 5 ft., plus special sizes. They consist of two layers of high-strength concrete separated by 2 in. of rigid Owens-Corning Fiberglas insulation. Steel window frames were cast into the panels.

The panels were cast at the company's Marietta, Ohio, plant and were shipped to the job site by truck. A motorized crane was used to lift the panels from the truck and swing them into position against the building framework. The panels were erected at the rate of 4200 sq. ft. per day, with all walls being completed in less than five days. The panels provide a finished wall with no additional insulating or decorating required.

Wood-Fiber Concrete

DEVELOPMENT of a lightweight wood-fiber concrete in the West, where wood waste and diatomaceous earth are plentiful and relatively cheap, is being urged as practical and worthwhile by Prof. Friberg, Department of Agricultural Engineering, University of Idaho, who has done considerable research on the project. Mr. Friberg is currently in Sweden studying Swedish building materials and manufacturing methods. He states that his investigations so far indicate that none of the Swedish wood-fiber concrete is superior to that developed at the University of Idaho, but he believes that by combining some of the Swedish methods of production with those developed at the university, some very favorable results may be obtained.

Concrete Pipe Contract

PRICE BROTHERS CO., Dayton, Ohio, has a contract to supply $1,000,000 worth of high-pressure concrete sewer pipe for a $23,000,000 sewage system at Miami, Fla. The contract calls for three miles of 72-in. dia. pipe in 32-ton sections, the largest ever produced by the company. The pipe is being produced at the company's temporary plant at Coral Gables, Fla.

Precast concrete wall panels, swung into position by use of motorized crane, are bolted directly to the building framework. Erection was at the rate of 4200 sq. ft. per day

CHEHALIS READY-MIX CONCRETE CO. recently completed installation of a 500-bbl. bulk cement silo at its ready-mixed concrete facilities at Chehalis, Wash. The company operates six transit-mixer trucks and four 5-cu. yd. dump trucks. The company is affiliated with Martin Sand & Gravel Co. which operates a sand and gravel plant at Waunchs Prairie, Wash., near Centralia.

SEATTLE CONCRETE PIPE CO., Seattle, Wash., is producing large concrete slabs for the Hanford Works atomic plant. The 16,500-lb. slabs, which encase a framework of steel beams, are being fabricated at Yakima, Wash., and trucked to Hanford, where they will be used to cover large tanks at the atomic plant.

PERU CONCRETE CO., Peru, Ind., formerly owned by L. L. Conaway and H. W. Gatlin, has been purchased by Glenn and Carl Jenkins. The concrete block plant interior was remodeled and automatic machinery installed shortly after the purchase. Plans are being made to expand production in 1954 to include other concrete products.

GILLETT CEMENT PRODUCTS CO., Gillett, Wis., has expanded operations by the addition of a ready-mixed concrete plant and a sand and gravel washing and screening plant. The company produces over 1,000,000 concrete and cinder block per year.

W. E. ANDERSON SONS CO., Columbus, Ohio is building its seventh ready-mixed concrete plant on a newly acquired, 23-acre site at West Columbus, Ohio. The plant, which will cost approximately $150,000, is expected to be in operation by April, 1954.

KARL RIEDEL, Sandusky, Ohio, recently announced his resignation as president and a director of Sandusky Cement Products Co., selling his entire interest in the company to Russell Kelly, a Sandusky insurance executive.

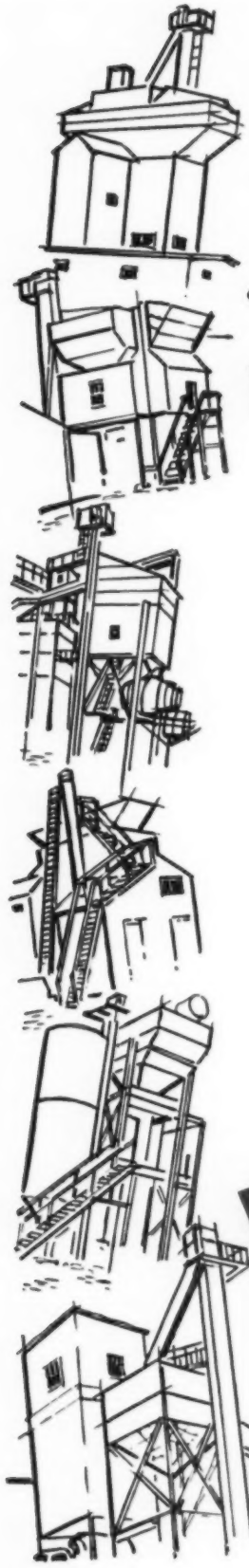
KENT CONCRETE PRODUCTS CO., Kent, Wash., has been purchased by John Hilliker and Lawrence Sadler, and will continue concrete products production, specializing in septic tanks and drain tile.

ARCHBOLD CONCRETE PRODUCTS, owned and operated by John G. Miller and Willard DeGroff, has added a concrete batching plant to its plant operations at Archbold, Ohio.

GEARHART LUMBER CO. has started operation of a concrete block plant at Oswego, Kan. William Harraughty is in charge of production.

BRIKCRETE INDUSTRIES OF MARYLAND has started production at its new concrete brick plant in Baltimore, Md. A. P. Munderloh is president of the company.

TILO ROOFING CO., Stratford, Conn., has started production of asbestos-cement shingles.



As Competition Gets TOUGHER ...You'll Really Appreciate Your BUTLER Plant

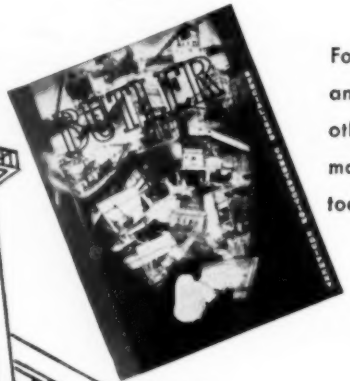
To maintain a good profit level in a competitive Ready Mixed or Concrete Products market, two things are required:

management know-how
and
the economy and efficiency of a BUTLER Engineered Plant.

BUTLER Engineering starts at the grass roots — your plant site, to take advantage of its terrain. BUTLER Engineering makes careful evaluation of your market and potential for growth as well as availability of materials and their economical transport. And of course, BUTLER Engineering studies all problems in flow of materials, labor saving through automatic controls; production simplicity — all at the lowest practical investment level to meet your customers' service requirements.

Further, although every BUTLER Plant is intensively studied and individually engineered, great economy is obtained by using components of standardized Butler manufacture.

These are sound reasons why your wisest move is to consult the BUTLER Engineer!

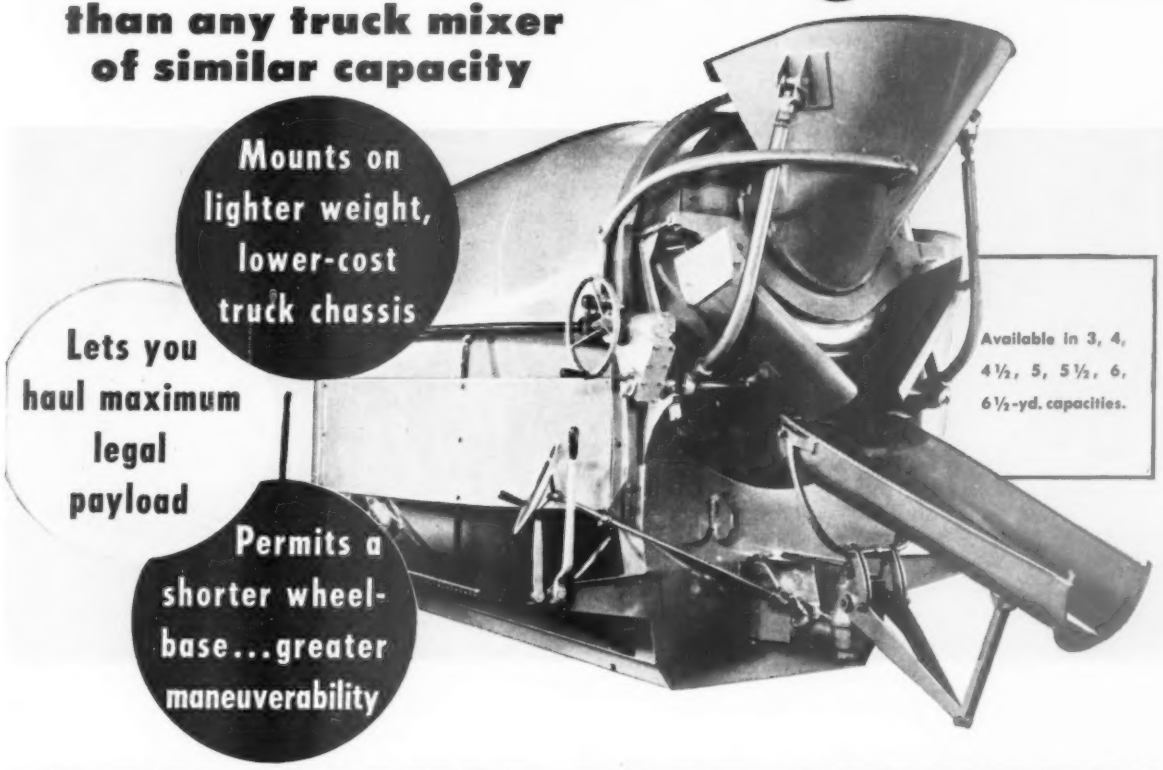


For a showing of BUTLER Ready Mixed Concrete Plants and BUTLER Concrete Products Plants together with other materials handling equipment which BUTLER makes, write for Bulletin 260. Send a postcard — today.

BUTLER BIN COMPANY
993 Blackstone Avenue
WAUKESHA, WISCONSIN

Shorter and lighter!

than any truck mixer of similar capacity


Mounts on lighter weight, lower-cost truck chassis
Lets you haul maximum legal payload
Permits a shorter wheel-base...greater maneuverability
Available in 3, 4, 4½, 5, 5½, 6, 6½-yd. capacities.

LE ROI-TRANSO LOAD CHAMPION

You carry full rated capacity within gross vehicle weight limits . . . make more round trips daily . . . and cut costs all around — with the Le Roi-Transo Load Champion.

Light weight and compactness are only two of the reasons why you enjoy such profitable performance. The patented Transo direct drive is another. It reduces non-productive dead-weight — eliminates ring gears, chains, and sprockets; thus cuts replacement and maintenance costs.

The Load Champion has many other equally practical features, other operating advantages. It has good mixing action. It loads fast. It discharges slump concrete speedily. It starts and discharge-reverses with a full load without shock.

Ask your Le Roi-Transo distributor to give you all the details. Or write for bulletin.

Le Roi-Transo DeLuxe Transo-mixer. 12" to 17" shorter than any other mixer-agitator of equal capacity—1,000 to 1,600 lbs. less dead-weight. 3, 4, 4½, 5, 5½, 6, 6½-yd. capacities. Available with fluid couplings or torque converters.

TD-11

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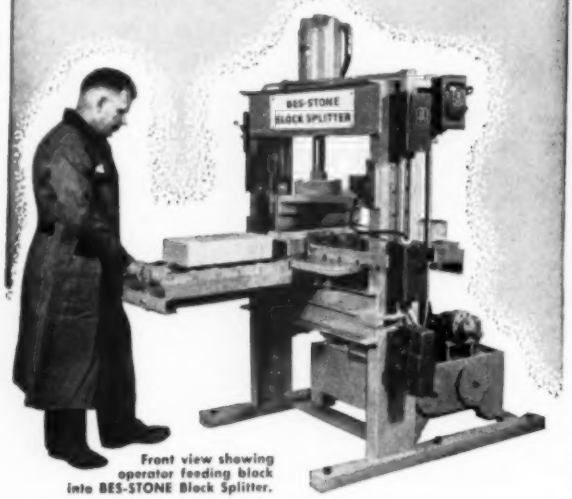
A Subsidiary of Westinghouse Air Brake Co.

TRANSO DIVISION

3716 W. WISCONSIN AVE. • MILWAUKEE 8, WIS.

Plants: Milwaukee • Cleveland — Greenwich — Dunkirk, Ohio • Coldwater, Michigan.

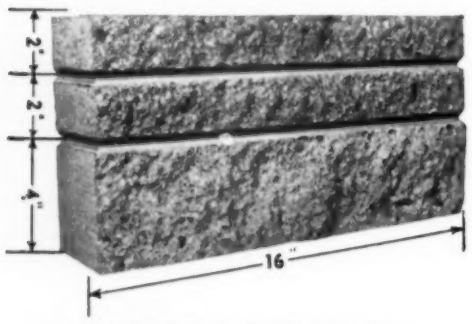
BES-STONE
BLOCK SPLITTER



Front view showing operator feeding block into BES-STONE Block Splitter.

- **Operates Automatically**
- **Produces 960 Split Block Per Hour**
- **Easily Adjusted for Various Heights**
- **Splits in a Straight Line — No Culls**
- **Has a Powerful Hydraulic Action**
- **Combines Quiet Operation with Safety**

Here is another Besser machine — the BES-STONE Block Splitter — designed primarily for the Concrete Products Industry. The machine splits block with speed and precision, in a variety of modular sizes. It's fully automatic. The block is placed under the knife automatically . . . the blade descends with a smooth, hydraulic action . . . and the split block is ejected by the incoming block. The operator is always at a safe distance. The BES-STONE Block Splitter enables plant operators to offer additional lines and affords new profit possibilities. Write for Bulletin No. 95A.



BES-STONE in Modular Sizes

BES-STONE, the product of the BES-STONE Block Splitter, is a new masonry unit with a split-stone appearance, made in many sizes and in a series of attractive, permanent colors. You'll find it complements, and greatly increases your sales of standard stripper block.

BESSER

Complete Equipment for Concrete Products Plants

BESSER MFG. CO., ALPENA, MICH., U. S. A.

EXTRA SALES for you
in Houses with Basements

Home owners want basements. Tastes differ by regions but for the nation as a whole there is an overwhelming preference for basements.

Latest surveys conducted by national magazines show this demand. Here is the proportion of those surveyed by each magazine who want basements:

American Home	**67.0%**
Better Homes and Gardens	**65.0%**
Colliers	**73.0%**
Curtis Publishing Co.	**76.9%**
Living	**68.3%**
McCall's	**72.8%**
Parents	**76.3%**
Small Homes Guide	**65.2%**

Such popularity is easily understood. A basement provides the most economical space for storage, heating plant, playroom, workshop, darkroom or laundry. Putting these facilities in the basement leaves more lot space for lawn, flowers and outdoor living.

Inasmuch as there exists such a strong demand by prospective home owners for basements, they constitute a good source of additional sales. In many designs more block are used in the basement walls and partitions than in the rest of the house. That's why many leading concrete masonry manufacturers find it pays to promote basements—with concrete masonry foundations and partitions—among architects, builders and lending agencies.

PORTLAND CEMENT ASSOCIATION

33 West Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

Jaeger 5½ yd. "Mix-Plus" on new White "Centipede" truck

How to haul 6 yds. legal payload with 8,950 lbs. on the front axle

W. E. Anderson Sons Co., Columbus, Ohio, are using 6 of these Mix-Plus Centipedes to haul 6 cu. yds. of concrete and 100 gallons of tank water, keep well within Ohio's 31,500 lb. weight limit, yet carry less than 9,000 lbs. on a front axle that is only 190" from midpoint of the rear duals.

It's done by dividing the front load equally between the front axle and an additional "steering-pusher" axle, equipped with single tires which steer in a 1-3 ratio with the front wheels.

Gross Vehicle Weight	
GBW (mixer, 100 gals. water, 6 cu. yds. concrete)	33,500
Truck: White WC-2284	15,400
	48,900
Weight Distribution	
Tandem Axle	31,150
Front Axle	8,950
Steering-Pusher Axle	8,800
	48,900

The mixers are latest Jaeger 5½ yd. "Mix-Plus" model, with sealed end-loader and side panels. They were selected for maximum payload capacity and fastest possible charging, mixing and discharging actions. Hydraulically actuated super-Comatic transmission provides shock-proof drum operation. Mix, tempering and flush water are jetted through front end of drum at 60 gallons a minute, at 65 lbs. pressure. A 3-piece chute provides 5 lengths up to 13 ft. for exact spotting of material.

Jaeger "Mix-Plus" units, meeting industry standards and acceptable on all ready-mixed concrete work, are available with 12 optional choices of equipment to meet any operating requirements and local conditions. For full-profit payloads, and faster payload trips, talk with your Jaeger distributor—or send for Catalog TMH-3.

THE JAEGER MACHINE COMPANY

603 Dublin Avenue, Columbus 16, Ohio

TRACTOR LOADERS • PUMPS • COMPRESSORS • CONCRETE MIXERS • PAVING MACHINES

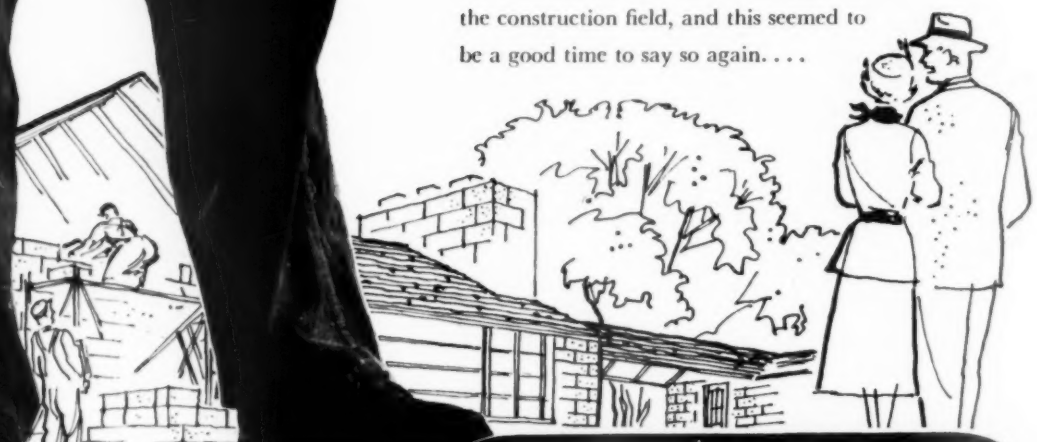
A SALUTE TO THE

Concrete Masonry Industry

ON ITS SEVENTH SUCCESSIVE

BILLION-PLUS YEAR

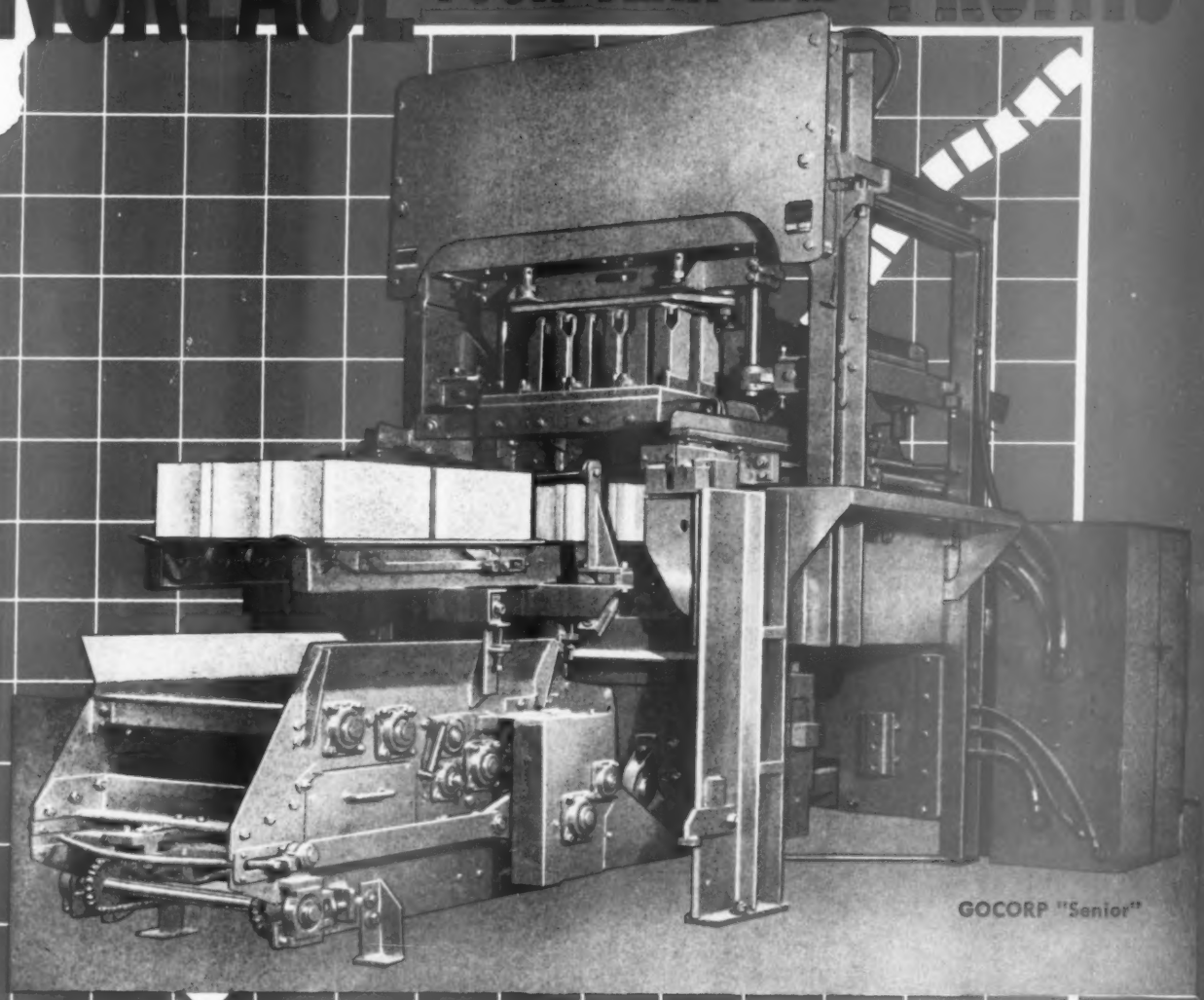
The remarkable record of the Concrete Masonry Industry during the past seven years in producing the equivalent of over Nine Billion sq. ft. of 8" Masonry Wall Units has few parallels in building industry history. . . . This production has been equal to about two-thirds of all masonry walls built in the United States during this period. . . . This unprecedented growth of the Concrete Masonry Industry has been the direct result of the quality, utility and economy of concrete masonry walls, and the superior service of progressive locally-owned companies. . . . The Waylite Company is proud to be a part of such an outstanding industry in the construction field, and this seemed to be a good time to say so again. . . .



WAYLITE

MASONRY UNITS

INCREASE YOUR YEAR END PROFITS



GOCORP "Senior"

with a GOCORP

Because GOCORP Plain Pallet Machines (The King —6 at a time or the Senior—3 at a time—illustrated) mean ✓ a quality product that helps you [illegible] customers and repeat orders ✓ quantity production for lower *unit* production costs ✓ reduced maintenance and uninterrupted production allowing you to keep the profits you've made.

AND with a GOCORP there's no fear of obsolescence.

For complete information on plain pallet machines, batch mixers (12 to 75 cubic foot capacity), pipe and tile machines, or junior cored pallet block machines write or phone today.

HERE'S HOW GOCORP DOES IT—

- **Direct Feed** from main supply hopper to mold (no old fashioned feed drawer) plus intense vertical vibration (pallet clamped to mold) assures a uniformly dense unit.
- **Sequence Operation** for easy adjustment and greater production. Under Machine Pallet Return—saves space and reduces labor costs with one man operation.
- **Hydraulic Drive**—Smooth trouble-free performance—reduces maintenance. GOCORP'S Johnny-on-the-spot factory trained men for help when you need it.
- **Advanced Design** gives you "Tomorrow's machine today."

GOCORP
ADRIAN-MICH.

407 Grace Street Adrian, Michigan

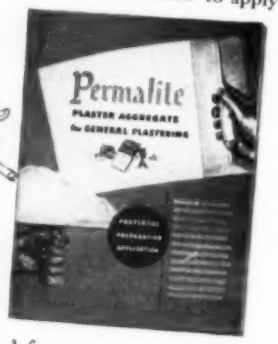
Lightweight Plaster made with

Permalite

is only ⅓ the weight of sanded plaster

FACTS presented in this new authoritative brochure can put *you* money ahead!

Complete tables and specifications ... how to mix ... how to apply.



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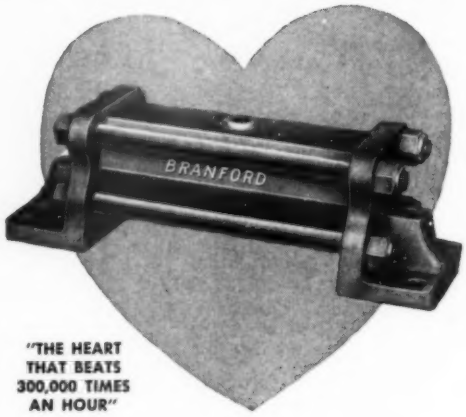

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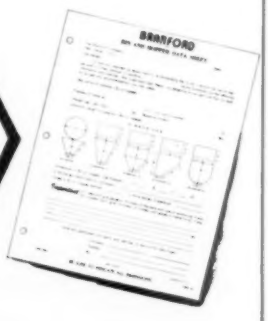

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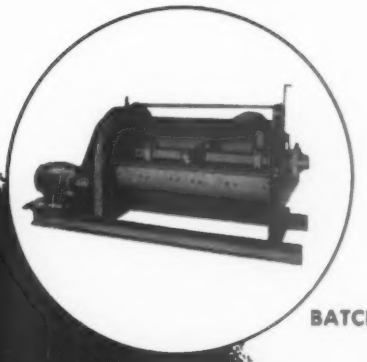

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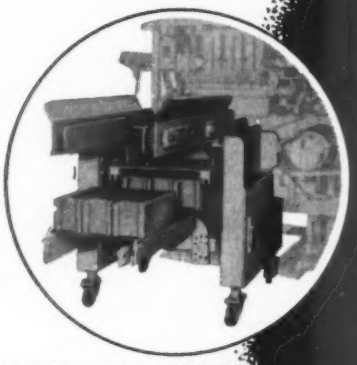

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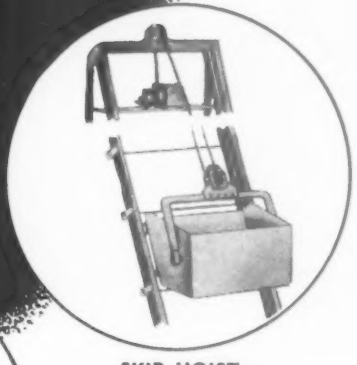

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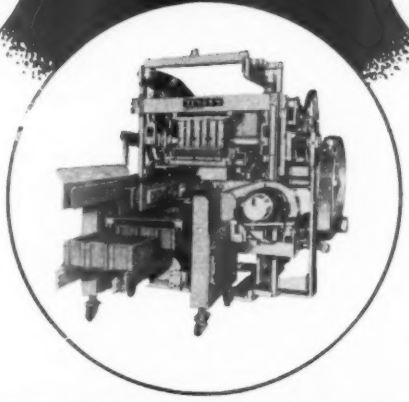

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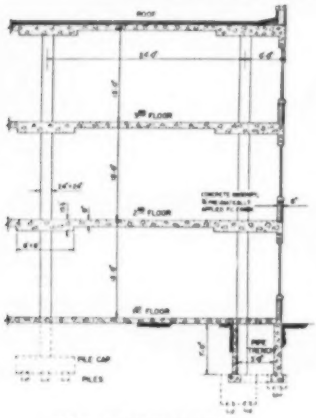

SECTION THRU TYPICAL EXTERIOR BAY

● New Finance Center at Fort Benjamin Harrison, near Indianapolis, second largest all-concrete administrative structure in the world, dwarfed only by the Pentagon, now houses Army Finance Operations, formerly scattered throughout the U. S.

Utilizing streamlined concreting methods, the 3-story, flat-slab, reinforced-concrete structure, with 1¼-million sq. ft. of usable floor space, was completed ahead of schedule, in spite of strikes, cyclone and blizzard. A total of 83,000 cu. yds. of concrete, pumped to all points within the 14-acre building area, was placed at a yard-a-minute pace.

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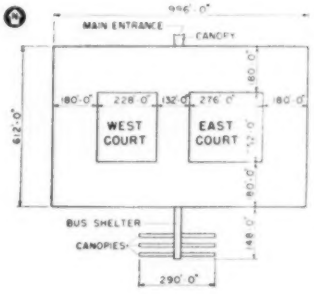

PLAN VIEW

FINANCE CENTER, U. S. ARMY:
Fort Benjamin Harrison, Indianapolis
E. J. BEAN, Brig. Gen., U.S.A., Commanding
Supervision: **U. S. ARMY CORPS OF ENGINEERS**, Chicago
Architects-Engineers: **HARLEY, ELLINGTON & DAY**, Inc., Detroit
Ready-Mix Lone Star Concrete—Joint Venture:
READY MIXED CONCRETE CORP. • **HESTON CONCRETE CO.**
CARLSEN CONCRETE SUPPLY, all of Indianapolis
Masonry Units: **SPICKELMIER COMPANY**, Indianapolis

General Contractors—Joint Venture:
SHERRY-RICHARDS CO., Chicago
C. E. YOUNGDAHL & CO., Inc., Long Island City, N. Y.
CORBETTA CONSTRUCTION CO., New York
JAMES McHUGH CONSTRUCTION CO., Chicago
Contractor for Water Supply, Sewers, Railroad Siding:
CALUMET PAVING COMPANY, Zionsville, Indiana
Piling: **CASEY & CASE**, Detroit

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DIVERSIFY to Expand Business

Starting with a small plant in 1927, the Rinker Companies have grown to be one of the largest concrete products and ready-mixed concrete enterprises in Florida with plants in five cities. Newest plant is at Ft. Pierce. Company is a large distributor of steel, plaster, and masonry supplies

By C. E. WRIGHT

New block plant at Fort Pierce, Fla., has a production of 6400 block per day. Hourly production can be stepped up to 950

ANYONE MOTORING down the lower east coast of Florida has probably not failed to see the trucks of the Rinker Companies. They seem to be everywhere. They are a sign of one of the most successful ready-mixed concrete and concrete block enterprises in the Sunshine State.

Success stories have become almost a dime a dozen in many lines of business, but the success of the Rinker Companies (Rinker, Inc. and Rinker Materials Corp.) has a little different twist. Started in 1927, about one year after the collapse of the Florida real estate boom when the outlook in Florida was rather dim, it was given another big push forward on the ruins of the depression of the 1930s.

Perhaps there is something in the slogan on a card alongside the clock in the executive office of the company that expresses the push that has driven the Rinker Companies forward through bad times and good times. It reads: "Sell the line all the time." The Rinker line now consists of concrete block, comprising 20 percent of the volume; ready-mixed concrete, steel, plaster, masonry supplies and sash. The latest expansion of the Rinker business is a new block plant at Fort Pierce, with a production of about 6400 block per day.

M. E. ("Doc") Rinker, who will take office as president of the National Concrete Masonry Association, at the annual convention in Washington, D.C., February 8 to 11, started the business in 1927 with two trucks and a tourist shanty of Celotex, which he bought for $15, for an office. He handled only crushed stone and sand from his West Palm Beach location. Many other Florida concerns in the masonry supply business had folded with the collapse of the Florida boom. Mr. Rinker got in to pick up some of the pieces. It was slow going at first. He had just become fairly well established when along came the stock market crash of 1929 and the subsequent depression. But in 1933, when the Federal Government started buying stone for construction work, Rinker Materials Corp. was the only one in the business in the West Palm Beach area.

In 1934 the company established at West Palm Beach the first ready-mixed concrete plant in Florida. Along with the rest of the country, Florida, though hit by two depressions, was slowly getting back on its feet. Construction work began to pick up, and the company was on the ground floor.

Left: Checking over the new block machine with President M. E. Rinker, to the right. Right: Fork lift trucks are used to move block from the machine to stockpile area

One of the newer transit mix trucks alongside concrete block stockpile area

Mr. Rinker doesn't attribute whatever success his company has had to any magic sales formulas. His business has grown with Florida. But he credits the fact that he was able to stick it out when others fell by the wayside, to "starting small." His original investments in any new undertaking were never more than $1500 to $2500. "It takes 20 times that amount now," he says, "to start a new venture." He cites a new plant for ready-mixed concrete and building materials to be started at Stuart, Fla., as an evidence of that fact. "We didn't get our heads in the clouds when we started anything new. We started small and let it develop."

That this policy has paid off is indicated by the large annual business volume and the growth of its plants and truck fleet. The original two trucks have expanded to 60 vehicles of various types.

With large plants and general headquarters in West Palm Beach, two at Fort Pierce, and one in Lake Worth, Vero Beach and Stuart, and one planned at Boynton, the Rinker Companies pretty well blanket the lower middle east coast of Florida from Melbourne to Delray, a distance of 125 miles and west about 50 miles to the Lake Okeechobee area. They have two modern block plants, the first one built at West Palm Beach in 1944, where there are two Besser block machines, and the latest expansion, a new one-machine plant at Fort Pierce, which recently went into production.

Fort Pierce Plant

The Fort Pierce block plant, built at a cost of $200,000, is well situated to advertise the Rinker business. Full advantage has been taken of this location alongside U. S. Highway 1, the main travel route between Jacksonville and Miami, by erection of a large sign welcoming visitors to Fort Pierce and saying something about the Rinker companies. As the approach to Fort Pierce from the north is on high ground, the sign can be seen four miles away, as a curve in the highway makes it appear to straddle the road.

Although the Rinker Companies' main offices are in West Palm Beach, where it got its start, it has been identified with Fort Pierce since 1945, when it installed the first ready-mixed concrete plant in that immediate area. Thus its reputation in the community was already well established when the decision was made to establish a block plant there.

This new block plant is equipped to produce low-cost, high-quality block. A new Besser Super Vibrapac fully-automatic block machine with latest innovations has been installed. Its capacity is 950 block an hour. The block machine has the standard Besser front-end pallet return.

There are six kilns with 8-in. concrete block walls, poured concrete roof plastered with 1-in. thickness of vermiculite, and standard aluminum doors manufactured by the Universal Door Co., Indianapolis, Ind. Each kiln is 10- x 38-ft., with 11 racks each holding 108 block. The operating room is 42 ft. 2 in. by 49 ft. 8 in., parts room 19 ft. by 20 ft. 8 in., steam room 15 ft. 8 in. by 20 ft. 8 in., and there are two toilets. Overall outside dimensions of plant and kilns is 64 ft. 8 in. by 107 ft. All outside walls of the plant are of concrete block, with the exception of the north side, which is corrugated steel to allow for future expansion.

In the balmy climate of Fort Pierce, steam curing has been found unnecessary. Because of the large capacity of the block machine there is ample time for curing in the storage area, which will hold 400,000 finished block. The block racks in use are the standard Besser design of 108 units as against 72 units in the racks used at the West Palm Beach block plant. Experience at Fort Pierce has proved that the larger racks are more efficient as more time is available for cleaning up between loads from the machines to the racks by the lift operators. Towmotor and Clark fork lift trucks are used for all handling. A ground level warehouse facilitates operation of these trucks.

Materials Handling

Approximately three carloads of raw materials are handled each day. Storage bins, manufactured by the Butler Bin Co., have four compartments, one for cement of 550 bbl. and three for aggregates of 75 tons each. From hopper bottom cars, the materials are carried to the 65 ft. high bins by belt, screw, and bucket type conveyors. Crushed stone from the Miami area is the coarse aggregate used, while fine aggregate is a silica sand obtained from the Lake Wales area, 150 miles east. Coarse aggregate is obtained from a new quarry at Deerfield, only 90 miles south.

Building block of two weights, in 8- x 8- x 16-in. size, are being made at the Fort Pierce plant; one a thin wall, two-hole unit weighing 33 lb., and the other, a three-hole block of 38 lb., this light weight being obtained by reason of the porosity of the Florida limestone used as a coarse aggregate. Two standard partition blocks are also being manufactured in 4- x 8- x 16-in. and 8- x 8- x 16-in. size.

The plant is situated in the middle of a paved area, 200 x 350 ft., the entire property being 275- x 875-ft. The unused space eventually will be used by removal of the Fort Pierce ready-mixed concrete plant, steel fabricating yard and other facilities from the present location, a mile south of the block plant.

Close control of concrete mixes is obtained in the modern laboratory

MASS PRODUCTION

of Pre-arched, Reinforced Concrete Floor and Roof Slabs

Subsidiary of Spickelmier Co., Indianapolis, Ind., built a new plant to manufacture Rapidex lightweight floor and roof slabs, using unique methods and specially designed equipment

By RALPH S. TORGERSON

AT A TWO-DAY OPEN HOUSE on October 15 and 16, Rapidex Company of Indiana, a division of Spickelmier Co., Indianapolis, announced a new lightweight, pre-arched, reinforced concrete floor and roof system.

An entirely new plant was constructed for mass production of the sectional slabs with special conveying, assembling, grouting, and crane equipment developed expressly for its manufacture and handling in the plant and for loading trucks. Specially-designed crane equipment also is available to unload slabs from trucks and set them in place on the walls, eliminating intermediate handling of the units.

The Rapidex slabs are assembled from Haydite concrete block units made in the Spickelmier block plant on the standard Besser Vibrapac machine with a mold that forms in the block units the interlocking, tongue-and-groove side faces of the assembled slab. The 8-in. Rapidex unit weighs 42 lb. per sq. ft.; the 6-in. weighs 30 lb. per sq. ft. Cured concrete Haydite units have a compressive strength of 3000 p.s.i. after 28 days.

Rapidex slabs, when exposed, have an attractive finished appearance, good light wave dispersion, excellent acoustical properties, high fire resistance, and provide a good bond for concrete toppings. Tests at Riverbank Laboratories indicate a 0.55 noise reduction coefficient. Rapidex is a structural system and finished ceiling combined, giving the appearance of a fine acoustical tile. Core holes are used for heat ducts, cold air returns, and for concealing piping and conduit. The slabs are manufactured in lengths up to 30 ft., and the 8-in. Rapidex with two 1-in. diameter deformed steel reinforced rods will carry a live load of 59 lb. per square foot on a span of 29 ft. Production is now set up at the rate of 4000 to 5000 sq. ft. per shift. Although the plant was started experimentally in 1952, mass production did not get under way until recently.

Slabs are not stocked, but are made up for each job. From the contractor's blue-prints, the Rapidex engineering and drafting department prepares its own blueprints showing the location, length and height of each slab with provision for any openings for utilities, etc. Units are made in two widths for the slabs, so that the length of the assembled slab can be adjusted closely to the desired dimensions indicated in the blueprints of the job. A "combination chart" shows at a glance the number of each size of the units necessary to make up the slabs to proper length.

Units for the slabs are stocked in such quantity that at least 30-day yard storage is assured. The entire yard area is paved with concrete to speed up movement of fork lift trucks and to provide adequate drainage. Nearly a million units of all sizes, including Rapidex, are kept in stock at the Spickelmier Co. plant.

H. R. Carper, in charge of the Rapidex slab plant, standing alongside semi-trailer tractor-truck on which loaded pallet is being lowered by gantry crane

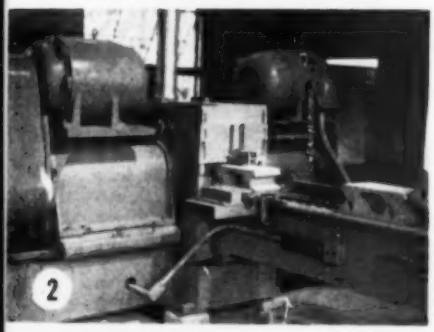
Manufacture

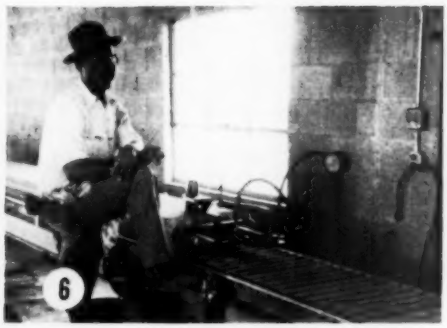
The first step in manufacture of the slabs is to precision-grind the compression faces of the units which have been delivered on pallets to the grinding building by fork lift trucks. The pallets are placed within convenient reach of the workmen operating the two Besly grinders. A short section of roller conveyor is used to feed the units to each grinder. In manufacturing the slabs, a grinder is used to grind the compression faces of each size unit. Each unit is ground to a micrometric tolerance. The result is a very smooth surface. There is a slight variation between the top and bottom of the unit or "Keystone effect" to provide "pre-arching" or camber in the assembled slab, which is designed to off-set deflection due to dead load. The result is longer spanning ability. On a 29-ft. slab, the camber may be close to ½ in. As part of the meticulous care in preparing for manufacture under mass production, a camber chart was developed from a study of the modulus of elasticity of various size slabs to determine the degree of camber and size of reinforcing for a given loading.

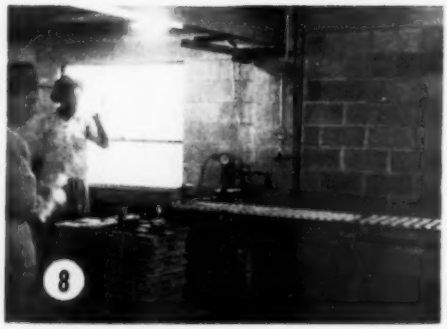
Connected to each grinder is a Rotoclone (wet type) dust collector which makes the operation almost dust-free. Dust sludge precipitated in the collector is removed by flight conveyor into a wheelbarrow. This material can be used as a fine aggregate. At the time of inspection, the grinders were being operated at the rate of seven units per minute but this rate could be boosted to 10 per minute.

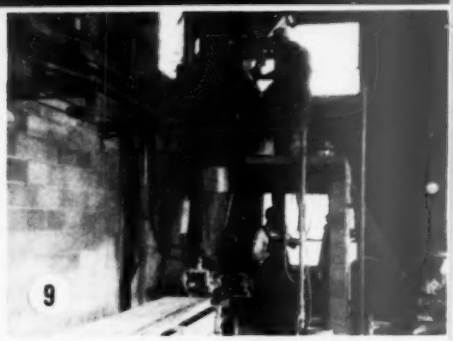
From the grinders, the units are placed on roller conveyors, one for each size unit. Units move by gravity on the conveyors, under cover, to the assembly building. At the point where the block on the two roller conveyors enter this building, two Cushman motor scooter, pneumatic-tired wheels with brake drums ride on top of the units and serve as brakes to hold them back and to make it easier to count the number of each size units needed to make up the assembled slab. The wheels are held in alignment by

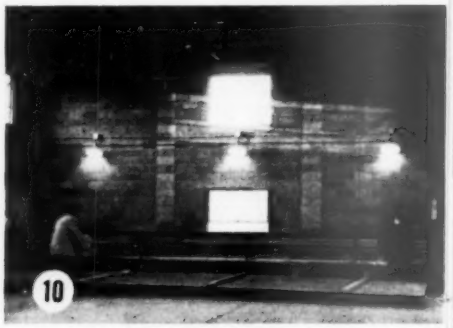
STEPS IN MAKING PRECAST SLABS

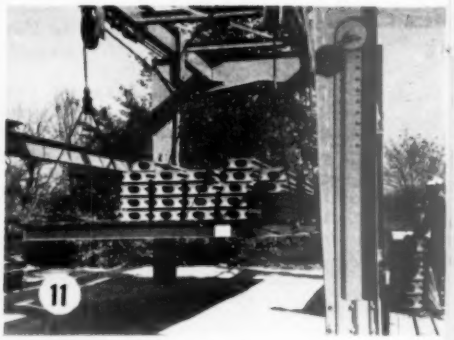












(1) Building in which two grinders are used to grind compression faces of specially designed block units that comprise slab. (2) One of two grinders that leave compression faces of units with polished surfaces. (3) Dust collectors for grinders. (4) Long roller conveyor leading from grinder building to assembly building, showing pneumatic tire wheels with brakes to hold back and permit easy counting of units. (5) Point where two conveyor lines converge to assembly conveyor section. (6) Blocks are aligned, tension bar and plates at each end are in place, ready for application of hydraulic pressure. (7) Key is driven into slot in bar which permits release of compression with bar taking tension. (8) Slab ready to move to grouting conveyor section. (9) Reinforcing bars receive grout under pressure from pump. (10) Overhead travelling crane used to place slab on truck loading pallets. (11) Gantry crane for loading truck. (12) Crane for handling slabs from truck to wall

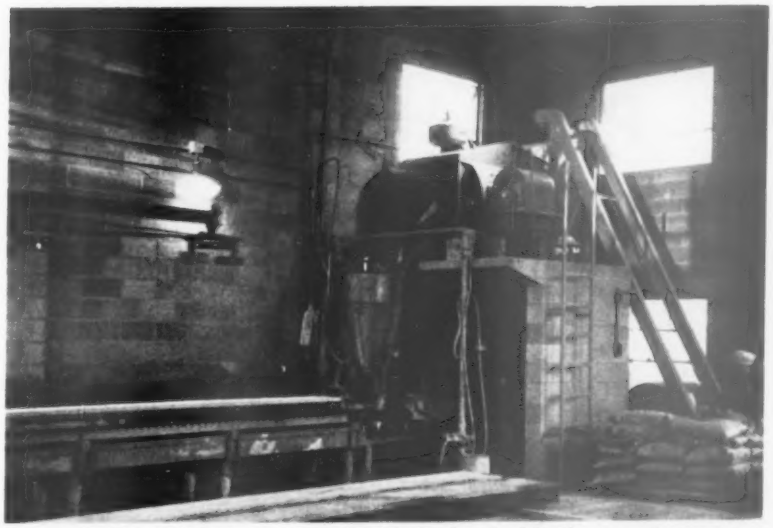
welded steel channel frames supported at the other end, above, by a horizontal pipe riding in vertical steel plate supports. The operator uses a brake lever on each wheel to release block in counting the different size units required to make up the slab.

In the slab assembly room, the two roller conveyors converge to bring together the correct number of each size units. This following section of roller conveyor, which is perfectly level, is used to align the block, place the units under compression, and insert the reinforcing preparatory to grouting. Air cylinders on one side of the roller conveyor actuate an aligning plate, pushing the units firmly into line to form the slab. Steel plates are then placed at each end of the assembled slab, and a deformed steel bar is inserted in the core hole to take the tension when hydraulic pressure is applied to the slab. At the end where hydraulic pressure is applied by two pistons, the plate is held accurately in position by a magnet. The tension bar is held firmly in the opposite end plate by a tension jaw, consisting of a truncated split fitting which conforms to the shape of the deformation in the tension bar and engages the plate through a hole provided for this purpose. When the two hydraulic pistons apply the pressure, a key is driven into the slot cut into the projecting part of the tension bar. The pressure is then removed with the bar taking the tension.

Reinforcing bars have meanwhile been inserted into the holes in the plates, lining up and centering them with the holes cast in the block units to receive the reinforcing. The slabs are then rolled forward to the end of the conveyor for placement of grouting around reinforcing bars. The size of the reinforcing bars is determined by the span and the live loads which the slab must support. The total length of the conveyor is about 250 ft.

Before grouting, streams of water are forced into the holes provided for the reinforcing to clean out any small particles and also to lubricate the comparatively dry grout and give a better bond. Holes in the far side end plate are smaller than the holes at the end where the grouting cylinders are located to assure complete penetration of grout. When the cement grout is pumped around the reinforcing bars, wads of soft paper are thrust into the two holes at the opposite end. An air cylinder brings the two grouting pipes firmly against the end plates over the openings where the reinforcing bars are centered, and the grout is pumped into place under pressure. Grout is mixed in a 6-cu. ft. Kwik-Mix Dandie concrete mixer on a platform, above, from which it flows into a tank that has an electric-motor-driven paddle to keep the grout agitated.

When grouting has been completed, an electrically driven, overhead travelling crane, with a lifting bar having



Grouting machine which forces grout around reinforcing bars in slab. Above may be seen mixer that supplies grout to agitating tank, and to the right is skip hoist for aggregate and cement

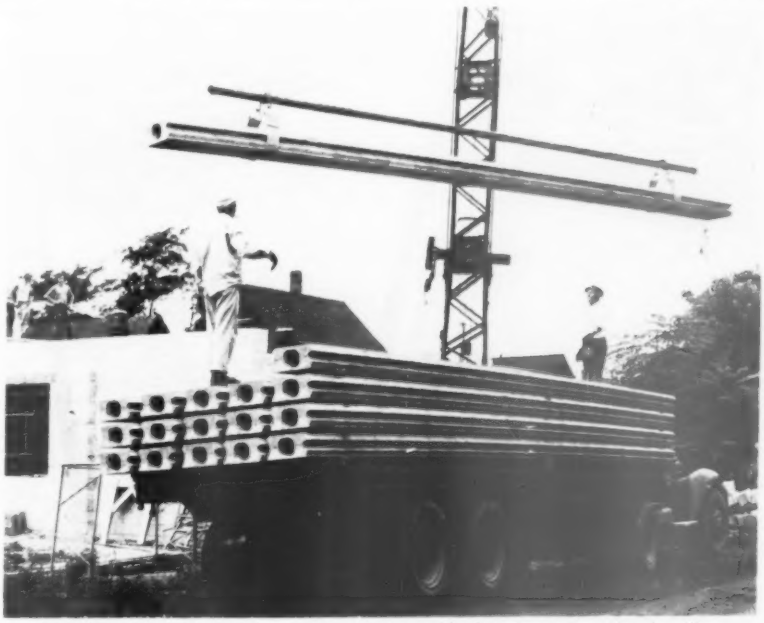
shoes that fit in recesses of the slab sides, is employed to raise the slab from the conveyor and place it on 2-in. wood strips laid crosswise on an 8- x 28-ft. pallet. Successive slabs are similarly stacked above each other on the pallet. About 1000 sq. ft. is stacked per pallet.

Pallets are fabricated with a base of 8-in. I beams reinforced with ten 6-in. channels for cross bracing. At the ends and in the center, heavy steel tubing, extending from one side to the other, is welded into place. The tubing is to receive the steel bars in the lifting mechanism of the heavy-duty gantry crane which transports loaded pallets into the yard for loading onto trucks. The pallets have a wooden floor.

Extending at right angle from the assembly room is the room where slabs are stored on pallets awaiting the curing of the grout around reinforcing. This room has steel rails laid in the concrete floor over which the heavy-duty, specially-designed gantry crane operates in transporting loaded pallets out of the building and into the yard where flat-bed semi-trailer tractor trucks are loaded. This crane was assembled and made to the company's own design. A Wisconsin 30-hp. air-cooled gasoline engine drives the gantry and operates a two-cylinder hydraulic lifting mechanism. Vickers hydraulic motors and pumps are used. The speed reducer and chain drive were supplied by Link-Belt.

When a pallet is to be raised for transportation into the yard or to be

(Continued on page 200)



Unloading slabs with special crane from truck to walls eliminates intermediate handling

Wisconsin Association

Plans Home Design Contest

Annual meeting of Wisconsin Concrete Producers in Milwaukee, January 19-20, approves new advertising budget and reviews new developments in industry

MORE THAN 175 members, associate members and visitors attended the annual convention of the Wisconsin Concrete Producers at the Plankinton Hotel, Milwaukee, January 19-20.

Following the welcoming address by President Ray W. Minette at the opening session, there was a business meeting for appointment of committees and the election of new officers. The officers for 1954 are: president, Fred Yahr, West Bend; vice-president, Loyal Clark, Warsaw; secretary, Edwin B. Bartlett, Milwaukee; and treasurer, Wm. Menard, Milwaukee. Board of directors include: Carl Thompson, Kenosha; A. L. Brown, Baraboo; Fred Radandt, Manitowoc; A. W. Devos, Milwaukee; Oscar Jensen, Janesville; and Cecil Hemstock, Sparta. Dr. J. George Senty, of Calvary Presbyterian church, Milwaukee, delivered the invocation.

President Minette summed up the 1953 program in his "President's Message" by pointing to the success enjoyed by the association's advertising campaign. He emphasized the need to continue the advertising promotion and to step up this year's program to keep pace with current trends. Pinned on display boards were copies of the advertising and promotional material to show the coverage in 1953 and how the association divided the advertising budget.

Ray W. Minette, outgoing president, left, and Fred Yahr, the new president

Mr. Minette urged the association to vote to continue the program during the coming year. He explained that the association had voted an assessment of 30¢ per 1000 block manufactured by each member to raise the $10,000 budget required for 1954. He suggested that this year's program should include a concrete masonry home design contest for architects, engineers and students. This contest, he said, would give the association the opportunity to present professional men with technical literature to use as reference in the contest and, of more importance, for future use in regular practice. He proposed the following prizes: first prize, $1000; second prize, $750; third prize, $500; fourth prize, $300; and $150 for the next six winners, a total of $3400.

In concluding his address, he cited seven benefits to be derived from continued advertising and the design contest: (1) new ideas and sound architectural views on masonry products would be developed; (2) better design and more uses for concrete masonry products would be achieved; (3) more publicity would result in better acceptance; (4) architectural designs for greater attractiveness would influence more people; (5) it would encourage design of two and three bedroom homes for today's needs at a more reasonable cost; (6) it would aid in selling masonry specialties, block partitions, planned basements with designs for separate activities; and (7) it would promote the specifying of masonry floors by pointing out that most fires start in basements, and it would sell safety. The vote for the advertising program was carried unanimously.

"Fundamentals of Credit and Collections," was the topic covered in a speech by Owen Berryman, vice-president and manager of credit sales, Pritzlaff Hardware Co., Milwaukee, and instructor at the University of Wisconsin. In defining credit, Mr. Berryman explained the origin of the word "credo"—signifying belief in or man's confidence in man, and from this springs the present day credit program. Credit, he continued, is the greatest single force in the world today because 90 percent of world business is based on credit. This power to purchase goods or obtain services today and pay later is the backbone of industry, therefore, he added, a trained credit representative is re-

Two samples of joint advertising which have proved very effective

President Ray W. Minette, left, and Art Devos, secretary for 30 years, at the opening session

YOUR COMPETITORS ARE BUSY
Lets do Business!
LETS GET OUR SHARE
YOU ARE GETTING HELP!
ARE YOU DOING YOUR SHARE
YOUR ASSOCIATION IS WORKING FOR YOU
LETS ALL DO MORE IN 54
JOIN NOW - Support Your Asso.

Display of advertising material available to members

quired to function properly. Included in the basic fundamentals are: Can he pay as per the terms; will he pay, and if not, can he be legally made to pay. Mr. Berryman terminated the talk by showing the importance of prompt payment in that 38 percent of the average net profit is made by discounting bills.

"An Approach to Today's Marketing Problems," was the subject of the address by Prof. Ralph E. Brownlee, department of marketing and College of Business Administration, Marquette University. The sales problem, he said, is the rapid change from a sellers to a buyers market. This situation must be met by a re-trained sales personnel taught to sell. Merely cutting price will not be sufficient. Advertising, he stated, must be designed to create a desire for the item, then be followed up by an efficient trained sales representative or your advertising dollar is wasted.

Advertising costs have increased in the past 10 years, continued Prof. Brownlee, and the practice of pooling advertising funds for greater program coverage, such as the association uses, will bring about the best results. He said this method is being more widely used in other industries.

The evening was completed with a cocktail hour, banquet and floor show. A highlight of the banquet was the presentation ceremony and congratulations of the entire organization to Arthur Devos who has been the association secretary for the past 30 years and is also the oldest member of the association. At this time, Ray W. Minette and the new president Fred Yahr presented Mr. Devos with a wrist watch as a memento for his many years of service.

President-elect Fred Yahr opened the Wednesday morning session by presenting the first speaker, W. J. Weigele, Housing and Cement Products Bureau, Portland Cement Association, Chicago, who had for his subject, "Better Construction of Concrete Masonry Walls." By means of slides, Mr. Weigele showed various methods of concrete masonry construction and assembly details. He explained the need for producers to promote the use of better construction methods in their advertising, thereby obtaining a more durable and appealing structure.

The next speaker, Wm. Markert, promotional manager, N.C.M.A., Chicago, presented the "Highlights of the 1954 N.C.M.A. Program." Mr. Markert used a display showing the many types of promotional advertising to be used by the N.C.M.A. in 1954. A detailed account of this program appears in ROCK PRODUCTS, January, 1954, page 220.

In the afternoon session C. A. Sirrine, executive secretary, Michigan Concrete Producers Association, addressed the meeting on the subject, "Inside Concrete Masonry—What Makes Our Industry Click." Mr. Sirrine said the building industry must seize upon every opportunity to promote good design, correct construction, procedure and sound material, for its best interests. This can be brought about only through the engineer or architect in a strictly unbiased way.

Mr. Sirrine explained the results of a concrete home design contest, similar in scope and coverage to that proposed earlier in the program by Mr. Minette.

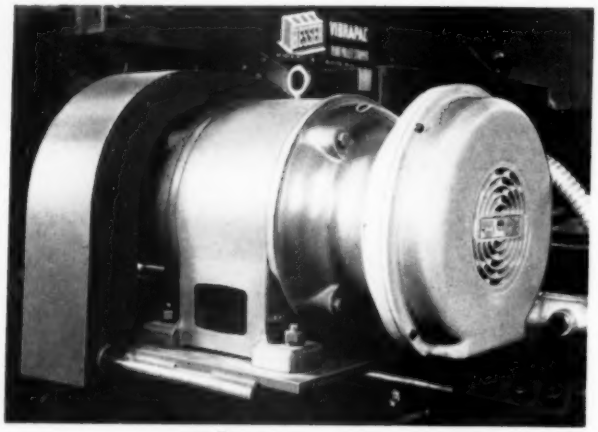
He indicated the results were extremely gratifying and exceeded all expectations. The publication of the 26 best designs submitted, together with the facts about home construction in concrete masonry, has resulted in the distribution of 35,000 copies throughout the 48 states.

Wm. J. Brull, president of the Minnesota Concrete Products Association

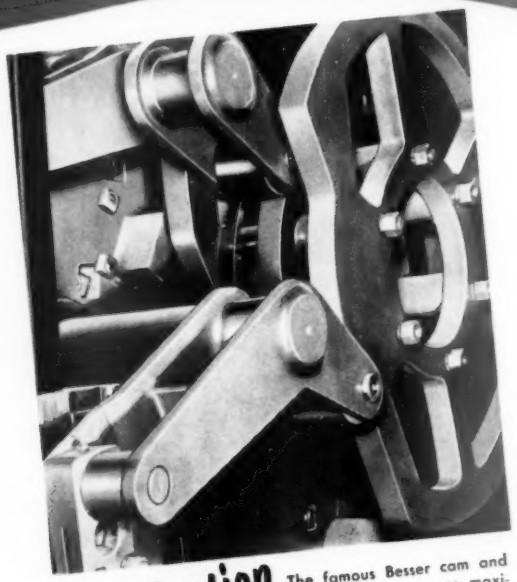
Wm. Markert from N.C.M.A. presents the national advertising program

Prof. Ralph E. Brownlee, Marquette University, one of the speakers

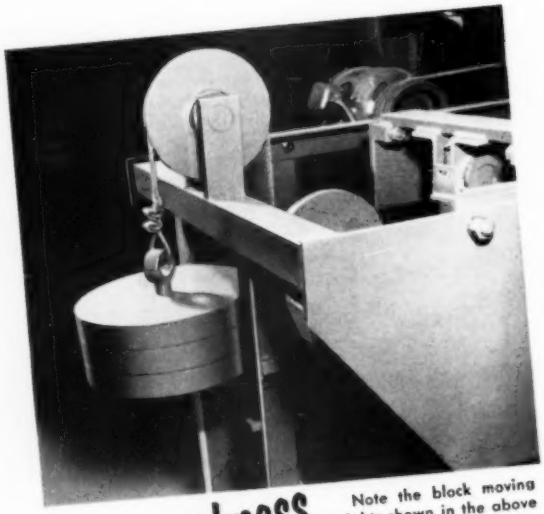
Besser Automatic Vibrapac



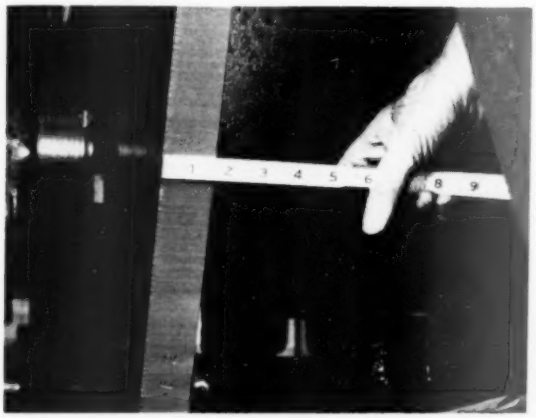
MORE power The Automatic Vibrapac provides unidirectional vibration from two 10 hp., high starting torque vibrating motors — DOUBLE the horsepower of any other block machine.



MORE production The famous Besser cam and roller principle assures maximum block production. The slow revolving cam, with a roller riding on its surface, delivers power with pin point precision and with steady, uninterrupted regularity.



MORE smoothness Note the block moving weights shown in the above illustration. These gravity actuated weights assure much smoother delivery of the finished block at high speeds.



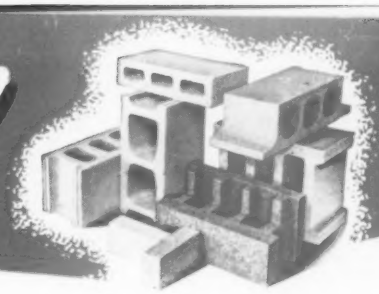
MORE ruggedness The machine frame of the all-steel electrically welded Vibrapac is made of 1½" thick steel — almost unbelievable, but it's a fact. That's why the Vibrapac is able to produce block, day-in and day-out, without interruption — for YEARS.

Your profits depend largely on the uninterrupted production of high quality masonry units. The Automatic Vibrapac enables you to reach this goal. It produces block of exact height and uniform density on a continuous production line. Three 8"x8"x16" modular units (or equivalent in other sizes) are made at a time on one Plain Pallet. No machine operator is required.

BESSER
50th Anniversary
1904-1954

A Half Century of

Gives You MORE!



The growth of the concrete block industry coincides with the growth of the Besser Manufacturing Company. 50 years ago, Besser made the first concrete block machine. Since then, the company has devoted its constant and untiring efforts to producing better block machines, pioneering new types and improving production methods. Today — the Automatic Vibrapac is the result of that half-century of pioneering and developing. The machine gives you MORE . . . more power, more smoothness, more ruggedness, and, what every block plant operator is primarily interested in, more block production. No doubt about it — the Automatic Vibrapac is the world's leading concrete block machine — a PROFIT MAKER for block plants everywhere.

BESSER MANUFACTURING CO. BOX 135, ALPENA, MICH., U. S. A.

The power off-bearing hoist, developed by Besser, gave the world the first power handling of block. It enables one man to off-bear the entire machine production.

Watch VIBRAPAC Work

Step into any Vibrapac block plant and see high quality block made, automatically. Notice there are no lost motions and no time is wasted. Pallets and mixed materials are fed automatically. As block are completed, they are quickly transferred to the racks. No manual lifting. Off-bearer merely guides the power hoist.

Originators of the Plain Pallet Principle

Vibrapacs are versatile. They make ALL types and sizes of high-quality masonry units on ONE set of Plain Pallets. Vibrapac Block are specified by progressive architects — used by leading contractors — produced and sold by leading concrete products plants.

Concrete Masonry Progress

J 5398

17. A producer views the ready-mixed concrete business . . .

JOB PROBLEMS

Affecting Concrete Quality

By JAS. A. NICHOLSON*

WHENEVER CONCRETE has failed to perform as expected it has been customary practice to hold contractors, finishers and aggregate producers principally responsible for all job troubles that develop. If concrete pitted or popped, the blame was placed on the aggregate producer. If concrete scaled, spalled, segregated, honeycombed, dusted or cracked, either the finishers or the contractor were generally given the blame. The principal job of the ready mixed concrete producer was to meet strength, slump and air specifications. Whenever the producer could somehow prove that the concrete met strength requirements he took the position that he was blameless.

Whenever their services or products have been used on a job that got mixed up with trouble, the design engineer, the cement manufacturer and the concrete technician, through mere coincidence, mutual protection or otherwise have somehow managed to avoid responsibility. For reasons sometimes difficult to comprehend, these parties have generally been careful not to point the finger of suspicion at one another.

When concrete quality troubles develop, the producer should be (and generally is) required to prove that he has fulfilled his responsibilities. It is his concrete and the person on the spot is his customer. A ready mixed concrete operator should always willingly give full cooperation to the effort of finding a satisfactory solution for a quality complaint. The same willingness to cooperate should also be forthcoming from all suppliers, the architect, the contractor and the concrete technician. On occasion, one or all of these parties may be at least partially responsible for some of the job troubles that we in the concrete industry must face.

Members of our industry get into trouble when something goes wrong (anywhere along the line) in the designing, processing, placing, finishing, curing and testing of concrete. We can get into trouble on our own; we may also become involved through the mistakes of others. This discussion is an attempt to honestly appraise the important problem of job troubles.

We are in trouble when concrete segregates or bleeds, air contents are too high or too low, concrete lacks workability, excessive air bubbles appear on the surface or at the forms, sand streaks or rock pockets become noticeable, cold joints develop, flash or rubber sets occur and cement fails to harden.

We are in even greater trouble when hardened concrete fails to develop required compressive strngth or when for any reason concrete scales, pits, dusts, cracks or in any other way, begins to disintegrate. These, then, are the troubles we've got to face in daily operations. In one form or another, each and every ready mixed concrete producer has experienced some or all of these troubles.

If our concrete mixes are not properly designed we should expect to face some of these job troubles—low strength, too much or too little air, segregation, poor workability, excessive bleeding, honeycombing, excessive shrinkage, dusting, scaling and cracking.

We should regularly ask ourselves some questions about our mix designs. Are we using correct percentages of sand and water? Are we using the most suitable top sized aggregate? Is air entrainment being used in exposed concrete? Are we holding our concrete to the proper w/c ratio? Is the concrete going to meet strength and durability requirements? Has a workable mix been designed? Unless we carefully select and handle aggregate, we will certainly be in trouble with such problems as pitting, popping, scaling, spalling, segregation, cracking, map crazing, dark patches, alkali reaction, workability and low strengths.

There are some questions we should ask about aggregates. Are we buying the best material, economically available? Are aggregates unquestionably sound and uniformly well graded? Are we efficiently handling materials to prevent breakage and segregation? Are we controlling the moisture content of the sand?

Should we fail to use a sufficient quantity of quality cement we can expect such troubles as low strength reports, porous concrete, alkali reaction (if reactive aggregates are present in operating area) uncontrolled air, failure to harden, flash and rubber sets, map crazing and cracks.

We should not be averse to asking some questions about cement. Are we using sufficient cement to do the job? Are we using too much cement? Are we buying the best cement, locally available? Are we buying air entraining cement or adding an air entraining agent to regular cement at the mixer? Do we know what kind of cement we are getting, regular or air entraining? Are we helping to alleviate the problem of hot cement by making changes in our operations?

The use of efficient weighing and mixing practices helps us to avoid such problems as lack of uniformity, premature stiffening, sand streaks, honeycombing, segregation, variance in strength results, changing slumps and uncontrolled air.

How efficient are we in our weighing and mixing operations? Did the customer get a full yield? Is there a possibility that the customer was short changed on the cement content? Was the addition of water closely controlled? Was the concrete properly mixed and efficiently discharged? Are we holding to a standardized mixihg cycle regardless of length of haul? Are we adding admixtures by means of an automatic dispenser or otherwise closely measuring them? Are the mixing blades in good condition? Are we able to deliver concrete of the desired slump and air content? How much variance is there between different parts of a load? Are we overloading?

Stanton Walker, director of engi-

*Pres. Nicholson Concrete Co., Toledo, Ohio

neering, N.R.M.C.A., on many occasions has reminded us of the importance of mixing time, "To insure uniform consistency, the number of revolutions at mixing speed and at agitating speed, should be so regulated that they are reasonably uniform from batch to batch."

Proper maintenance of the truck mixer is required if the unit is to operate at top efficiency. E. L. Howard, of Pacific Coast Aggregates Co., in one of his articles considered the problem of load variations—he examined differences in consistency from the front, middle and back portions of mixers. In his article in ROCK PRODUCTS, January, 1952, page 229, Mr. Howard submitted convincing test data, clearly showing the need for mixer efficiency. In a followup of a study of these tests, operators who are quality minded will probably want to hard surface the edges and top 2 in. of truck mixer blades in a sincere effort to improve the quality of their product. The condition of mixing blades should be carefully watched and mixing blades should be replaced before they are badly worn.

If we are unable to deliver uniform workable concrete of a suitable w/c ratio we can expect such job problems as low strengths, deterioration of exposed concrete, segregation, sand streaks, honeycombing, porous concrete and cold joints (resulting from load rejections or too long a time between trips.)

Are we consistently delivering concrete of the desired workability? Are we holding to safe w/c ratio limits? Are water valves on the truck mixer maintained in proper working condition? Are we careless about adding water on the job?

A principal deterrent to the certainty that delivered concrete will be quality material is the familiar job practice of adding water to transit mixed and agitator delivered concrete. A few producers who regularly process concrete of desired slumps have successfully resisted this customer practice by insisting that no water be carried on the truck and that none be added from any other source of supply. To enforce this rule a producer must be able to deliver concrete of the required consistency. If an operator can't regularly deliver concrete of the desired workability, the addition of water on the job may be a necessary measure.

If we don't regularly take stock of ourselves through effective inspecting, checking, sampling and testing procedures we will not have the answers when troubles come our way. When a ready mixed concrete company is quality-minded from top management on down, there undoubtedly will be fewer problems, the troubles generally will be of minor importance and other people, who are involved, will be inclined to move slowly in any attempt to place the blame on the concrete producer.

Even if we at our plants and on deliveries, are able to maintain high operating standards, we can still get into serious trouble on quality problems through the shortcomings and mistakes of contractors, finishers, cement manufacturers, aggregate producers and testing engineers.

A neat and efficient batching plant layout in a Middle West plant

In the absence of any particular trouble, a ready-mixed concrete operator can sensibly discuss mutual problems on quality with aggregate producers, cement company representatives, architects, contractors and concrete technicians. All seem to agree that we have these common problems and all apparently acknowledge certain definite responsibilities. The freeze comes when trouble strikes. Everybody starts looking for an out. All concerned begin to act like boys, not men. The laboratory technician and the architect get together in mutual protection. The material producer brings in an association engineer. A field representative of the Portland Cement Association may come to the aid of the cement manufacturer. The ready-mixed concrete operator gets someone from N.C.M.A. or engages the services of a consulting engineer. The contractor goes off on tangents. Disclaimers of responsibility come thick and fast. Almost in unison, everybody yells "Ain't my fault."

Contractor Trouble

Contractors get us into trouble when they order insufficient concrete, buy inferior quality concrete for intended job use, fail to place concrete properly, permit improper vibration or faulty finishing and do not adequately cure the concrete.

Contractors can be primarily responsible for quality problems involving low strength, honeycombing, sand streaks, dusting, cracking, crazing and excessive air bubbles (in slabs and at the forms.)

Too many contractors either purposely or carelessly under-order. They attempt to make an insufficient amount of concrete "last out." Some builders always have trouble with forms. The wrong kind of lumber is used, facings are not kept clean, forms are improperly constructed and supports let go. Workmen misuse vibrators to move concrete within wall forms, and through other improper vibrating practices cause excessive air bubbles to collect at the forms and too much paste to be brought to the surface. The subgrade may be poorly prepared—not deep enough, uneven, wringing wet or too dry and not compacted. Because of the grade, concrete is 3 in. thick instead of the specified 4 in. because of the variations in subgrade surface, concrete runs from 2 in. to 5 in. instead of the specified 5 in. Certain builders expect high slump concrete to flow on long, flat chutes, to places of deposit all around a building. Instead of 5½-bag cement, 1½-in. top size aggregate, 2- to 4-in. slump concrete which they should order, some try to get by with 5 bag (or less) ¾-in. top size, 7 to 10 in. slump concrete. They permit faulty finishing and tolerate the use of driers on slab surfaces. In the days following placement, too many contractors make no effort to protect the concrete. Actually some builders in bidding on work, make no provision for curing costs.

There is no excuse for these indefensible practices. Yet many concrete producers condone or at least tolerate such "goings on." There may be such a thing as contributing to the delinquency of a contractor. Producers should realize that they can get into enough trouble without looking for it. The sensible producer urges the use of low slump, quality concrete, stresses requirement of the proper grading

and repeatedly points out to contractors the necessity of adequate placing, finishing and curing procedures. In modern job practices, too much water is used in placing concrete; not enough water is used in curing concrete.

In our part of the country the principal quality problem concerns basement floors. There are many reasons why this is so. The contractor pours (not places) a relatively big slab of relatively thin concrete. As a rule, neither wire mesh nor expansion joints are used. The concrete goes on a poor base, one that is improperly graded and compacted. The floor is frequently tied into settling ("thin") footers. Considering the high slump which is generally used to chute concrete from one window all the way across, the cement content is simply not sufficient. Concrete may not be carefully compacted or efficiently finished. Climate conditions are frequently unfavorable with the damp (sometimes wringing wet) cold base tending to expand the bottom of the concrete and excessive dry heat from salamanders shrinking the concrete surface. Too much of our concrete simply doesn't get the favorable temperature and the continuous presence of adequate moisture which it requires. When placed in late fall or early spring, unprotected basement floor concrete in its early life may be exposed to cycles of freezing and thawing. In spite of all the obstacles that this new concrete must face, few contractors really attempt to properly place, finish and cure it.

In attempting to handle this problem we take these steps:

1. Urge the use of 3000-lb., 3 to 4 in. slump concrete.

2. Constantly bring job conditions to contractors' attention. Make them realize that in permitting such conditions to continue, they are asking for trouble.

3. Suggest that, for several days, water, wet sand or other protection be kept on the new surface.

4. Recommend that a hardener be applied to the concrete surface. If dusting develops, we furnish a hardener for immediate application.

5. Attempt to get home owners to accept some cracking difficulties. Many people seemingly believe that the development of a few cracks means that their house has begun to fall down.

6. In case of real trouble, we share expense of repairing damage or satisfying owner; e.g. one-third by builder, one-third by cement contractor, one-third by ready-mixed concrete company.

The contractor is also responsible for the acts and omissions of cement finishers who may fail to thoroughly work the concrete, merely slick, rather than efficiently finish the surface of the concrete, attempt to finish the concrete too soon, apply surface driers, make improper use of a "power finisher," work the concrete too much (bringing excessive paste to the surface) or contaminate the concrete by dragging up wet fill sand and mud with their boots and shovels.

In basement floors and other slab concrete, finishers use floating procedures to consolidate the placed concrete. The principal purpose of finishing operations is to consolidate the concrete surface. In placing and working of concrete, if the concrete is not thoroughly consolidated, planes of weakness are introduced. Finishing work should proceed only after concrete beneath the surface has been completely consolidated into place. Finishing operations consist primarily of using the surface paste to seal and densify a level concrete surface. Thorough consolidation must be accomplished if maximum strength, durability, appearance and economy are to be achieved.

In dealing with contractors on job troubles, always keep this admonition in mind—"Provide adequate moisture and favorable climatic conditions during the early curing period and there won't be any popping, cracking, dusting or crazing of the surface where quality concrete is properly placed and finished." In today's building operations we have a greater responsibility than just furnishing quality concrete which, in itself is a difficult assignment. We must make an intelligent continuing effort to see to it that concrete is properly handled on the job.

At the 1953 Concrete Conference of The Michigan Ready Mixed Concrete Association held at Michigan State College, three contractors served on a panel for a discussion covering contractor and ready mixed concrete producers responsibilities.

Boyd Arminger of the F. H. Martin Co., Detroit, made a number of pertinent observations on the matter of job problems and difficulties. He stated that the contractor and ready mixed concrete producer were too far apart in their thinking. He said that mutual dependence on one another and the importance of job problems call for a closer meeting of the minds. He urged that members of our industry arrange to hold meetings with contractor and architect groups, to discuss with them, parts each other should play in minimizing and eliminating these problems and difficulties.

He reported a rather general failure on the part of some producers to keep slumps of delivered concrete within specification limits. He correctly pointed out that a contractor assumes no responsibility when he orders that water be added to a dry load to bring the concrete up to specified slump and workability. He acknowledged responsibility for demanding water additions exceeding specification requirements.

He presented at least a practical solution to the problem of adding water on the job when he suggested: (1) producers should adopt controls assuring the delivery of concrete within the specified slump range; (2) water should be added only upon written authorization of contractor or his agents; and (3) if and when contractor's job representative signs for adding water, authorization should be noted on both contractor's and producer's copies of the delivery tickets.

The opinions of the three contractor members of this panel considerably strengthened my own previously held conviction that members of our industry need to maintain closer contacts with job operations.

Cement Trouble

Cement manufacturers enter the trouble picture when they sell air entraining cement as regular cement (or vice versa), fail to prevent contamination between regular and air entraining cements, deliver extremely hot cement in hot weather or unknowingly ship inferior quality cement, (e.g. provide cement in which gypsum has calcined.)

When quality of the concrete is questioned, cement is one of the variables that must be taken into consideration. The importance of variations in cement characteristics can be seen when some cements develop, in 7 days, 50 to 60 percent of their 28-day strength while others develop as high as 75 percent in 7 days. As a whole, the cement industry has undoubtedly done a better job of self regulation than we have in ready-mixed concrete. The better manufacturers attempt to furnish a cement somewhat above required standards.

Although a cement meeting A.S.T.M. requirements must be considered good material, it may still be poor cement for intended job use. A cement, at certain temperatures, may give excellent results. The same cement delivered at a temperature range above 170 deg. may be the chief factor contributing to the low strengths that certain concrete developed in hot weather. The use of a high alkali cement would be entirely satisfactory when used with most aggregates, but its use in concrete where reactive aggregates are present would be exceedingly dangerous.

An inferior quality cement can be a contributing factor to such job troubles as low strength, difficulty with air contents, failure to harden, flash and rubber set, cracking, map crazing and alkali reaction.

E. L. Howard has reported considerable variance with cements that he has studied on the West Coast. To get 3,000-lb. concrete, he was able to use as much as 8¼ gal. of water per bag with one brand; he had to use a maximum of 7 gal. of water with another brand. Other cements, which he tested, fell within these high and low marks. In the November, 1953 *A.C.I. Journal*, Mr. Howard approached the problem of cement variables from another angle. Using exactly the same materials throughout, with the single exception of varying the cement brand, the same mix design produced

(Continued on page 194)

NEW MACHINERY

Transit-Mixer Design

ROCKWELL SPRING AND AXLE CO., Timken-Detroit Axle Div., Detroit 32, Mich., displayed for the first time its "design of the future," the "Octo X Quad" transit-mixer truck, at the S. A. E. annual meeting on January 11

Transit-mixer "design of the future" on display in Detroit

to 15, 1954, in Detroit. It is a cab-over-engine design featuring power brakes and hydraulically-operated power steering on the two front axles. The truck is 24 ft. 3 in. long with a 140-in. wheelbase and has a gross weight distribution of 32,000 lb. on the rear tandem axle, and 18,000 lb. on the front tandem axles. The front axles are Timken FD-900, or FE-900, and the rear tandem drive axle unit is a model SLDD. The cab is an "extra vision" type which is said to enable the driver to operate under difficult pouring or unloading conditions, as well as on high-speed highway operations. The company is not planning to manufacture the unit, but to show what can be done with the design. The principles used in its construction can be adapted by commercial haulers other than concrete.

Surfacing and Patching Material

STATE ENGINEERING EXPERIMENT STATION, Georgia Institute of Technology, Atlanta, Ga., has developed "Surco," a mixture of a liquid synthetic rubber and a dry cement paste which, when applied over concrete, is said to provide a long-wearing surface, resistant to water, impact and abrasion. It is also reported to make the concrete last indefinitely. In addition to its application to concrete masonry surfaces, it will also bond to metal, glass, plaster, plaster board, stone and wood, and may be applied over large areas without the use of anchoring clips or expansion joints. It is said to be applicable as a moderately resilient surfacing material, as well as a patching composition for all types of concrete surfaces. Slight modifications of the composition result in a mortar suitable for setting tile, marble and similar products. Other modifications provide for its use as a putty, pointing material and spackle.

The material, basically an off-white color, can be produced in a variety of colors by incorporating certain types of colors and aggregates. When properly compounded, it can be sanded down to produce attractive terrazzo or artificial stone effects. The material, which can be mixed in either a mortar box or a small mechanical mixer, produces a paste similar to the consistency and working properties of plastic. On the job, this paste is applied to the surface and finished-troweled immediately, ready for traffic within 12 to 24 hr.

Masonry Water Repellent

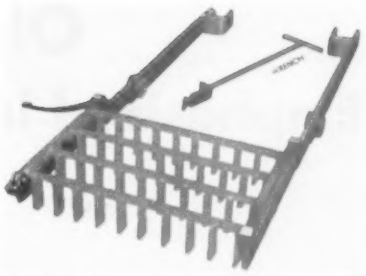
PRIMA PRODUCTS, INC., 10 East 40th St., New York 16, N.Y., has made available Silitex SF, a cement-based powder containing silicones and metallic compounds, to waterproof masonry. The silicones are said to provide a water-repellent coating with a minimum of absorption and yet retain the transpiration of the masonry. The compound binds chemically and mechanically to the surface, filling and expanding in the microscopic pores to seal against seepage and dampness. For application, the powder is mixed with water and must be applied within two hours of mixing.

Air Meter

AUTOLENE LUBRICANTS CO., Industrial Div., Denver 9, Colo., has announced the Protex air meter which gives a direct reading of air percentage in concrete without delicate pressure gauges and intricate procedure. The meter has a built-in air pump, funnel and clamps and requires 1½ pints of water. The entire unit weighs 19 lb.

Block Machine Features

BERGEN MACHINE & TOOL CO., INC., 189 Franklin Ave., Nutley, N. J., has announced two features of its block machine. Agitator grid support bars with a clamp locking device are being



Agitator grid support bars have a clamp locking device to prevent play between arms and grid

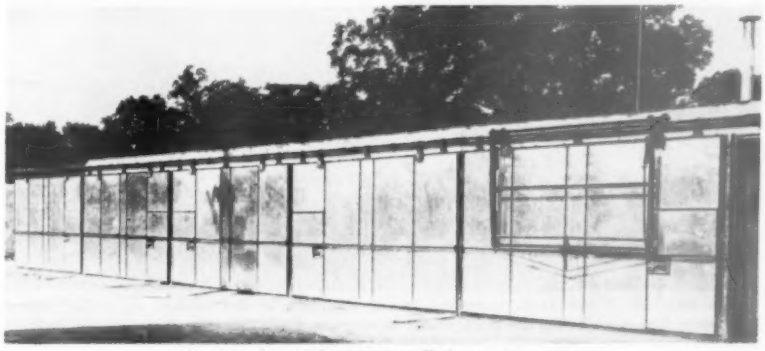
utilized to prevent play between the arms and grid, resulting in full agitation. The other feature is a cam type cut-off bar adjusting device which permits adjustments to be made while the block machine is in operation. The device provides for adjustments of $\frac{1}{32}$ in. at a time, even to tilting the bar off parallel, if desired. Both of these devices may be used on vibrating equipment other than Bergen.

Sewer Pipe Joint

UNIVERSAL CONCRETE PIPE CO., Columbus, Ohio, has incorporated a special type joint on its reinforced sewer pipe. The joint, designated "Armored Joint," combines steel joint rings and long-lasting rubber gaskets to insure against leakage or infiltration. The rings, embedded in the concrete pipe wall, are welded to the pipe's steel reinforcement. The rubber gasket is in a special groove in one ring to protect and confine it. The complete joint is said to provide ample flexibility to allow for normal contraction, expansion and deflection.

Insulated Kiln Door

MOORE DRY KILN CO., P. O. Box 4248, Jacksonville 1, Fla., has brought out metal-insulated kiln doors which have electrically welded frames to resist the tendency to warp or sag. The doors are constructed of corrosion-resistant materials, and the lightweight design permits easy movement for quick loading and unloading. The kiln doors are said to save steam, reduce curing time and last longer, and are available in carrier or hinge door types.



Metal-insulated kiln doors installed on curing rooms

Ohio Short Course
Emphasized Importance of Quality Concrete

OPERATING EMPLOYEES of ready-mixed concrete plants in Ohio put in three days intensively studying the fundamentals of quality concrete at the University of Cincinnati, Jan. 13, 14 and 15. The occasion was a ready-mixed concrete short course sponsored jointly by the civil engineering department of the university and the Ohio Ready Mixed Concrete Association.

One hundred and twenty-five men from 43 different Ohio plants attended the course. They heard some of the country's foremost concrete technicians predict that ready-mixed concrete will become increasingly important. They heard an explanation of the present trend toward strength specifications and were told why, under some conditions, Friday is a poor day to cast test cylinders on a construction job. They also heard speakers emphasize the vital importance of testing and deplore a lack of properly equipped commercial testing laboratories.

Short Course Committee

R. P. Mumford of Springfield was chairman of the association's Short Course Committee which worked out the study program and made all arrangements. Members of the committee included Prof. Cornelius Wandmacher, professor of Civil Engineering, University of Cincinnati; Ralph H. Anderson, of Columbus, treasurer of the association; Samson Crew, Cincinnati; L. A. Kemter, Cleveland; J. A. Nicholson, of Toledo, president of the association; Carl Shoaff, Akron, vice-president and Claude L. Clark, Columbus, secretary. The Cincinnati Short Course was the third held by the association, the two previous courses having been given in cooperation with Akron and Toledo universities.

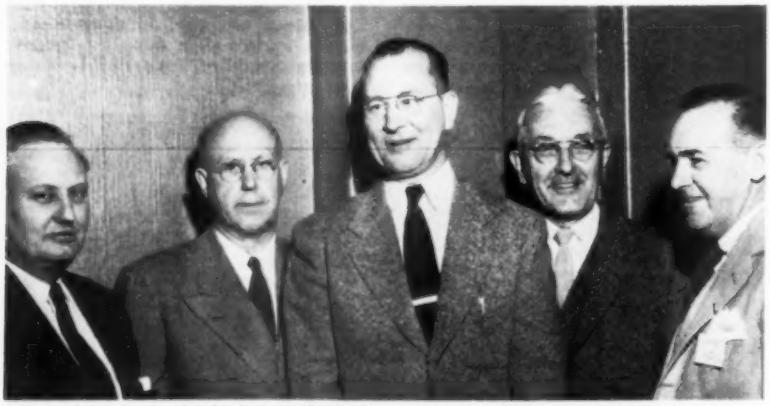
A guided tour through the Ohio River Division Laboratories of the U. S. Army Corps of Engineers at Mariemont, east of Cincinnati, was a feature of the second day program, Thursday, Jan. 14. On Thursday evening a banquet was held in the ballroom of the Sheraton-Gibson Hotel with 150 in attendance.

At the opening of the Short Course on Wednesday, Chairman Mumford introduced C. Albert Joerger, Dean of the College of Engineering, University of Cincinnati, who delivered an address of welcome.

Why, What and How

In responding to Dean Joerger's remarks, Carl F. Shoaff, of Akron, the association's vice-president, declared that the men assembled for the short course "are not only serious minded but are here for a definite purpose—that of learning more of the why, what and how of producing quality concrete, and especially ready-mixed concrete.

"The ready-mixed concrete industry has had an unusually rapid growth during the past ten years. In fact, it is a comparatively new industry. The transit-mixer truck had its origin in Ohio. The first president of the Ohio Ready-Mixed Concrete Association was the designer of the first transit-mixer truck. I refer to Mr. Stephen Stepanian of Columbus. The National Ready Mixed Concrete Association has recently recognized Mr. Stepanian as 'Mr. Ready Mixed Concrete' and conferred on him an honorary life membership in the national association, and also made him an honorary member of the board of directors.



Left to right: R. P. Mumford, Springfield, Ohio, chairman of the association's short course committee; Claude L. Clarke, secretary of the association; Prof. Cornelius Wandmacher, head of the Civil Engineering Department, University of Cincinnati; Dean C. Albert Joerger, of the College of Enginering; and Carl F. Shoaff, Akron, Ohio, vice-president of the association

"I do not have accurate information as to the magnitude of the production of ready-mixed concrete in Ohio," Mr. Shoaff continued, "but a few weeks ago I came across some statistics which indicate that this comparatively new enterprise has grown into a business that is producing 70,000,000 cu. yd. of concrete per year with an estimated value of $750,000,000. Today it is estimated that the ready-mixed concrete industry throughout the nation is using between 25 and 30 percent of the total annual production of cement. In Ohio I have reason to believe that the percentage is much greater, probably between 55 and 65 percent."

Following Mr. Shoaff's remarks, Prof. Wandmacher made a brief general statement of the objectives of the short course. He emphasized the fact that engineers now generally recognize the importance of the quality control work done by the ready-mixed concrete industry.

At the close of the morning session, the Portland Cement Association's color and sound motion picture, "The Drama of Portland Cement," was shown.

For Operating Personnel

Charles O. Dittrich of Cincinnati, vice-president of Hilltop Building Materials, Inc., presided over the afternoon session on Wednesday, introducing Committee Chairman Mumford. Mr. Mumford explained that this and the previous courses were especially designed to be helpful to the operating personnel of ready-mixed concrete plants—to teach them the why, what and how of good concrete. He declared that the water-cement ratio law and the introduction of air-entrainment were two of the most important things affecting the making of a quality concrete.

An outstanding feature of the Wednesday afternoon program was a symposium on "Why Quality Concrete is Essential." The subject was treated from the standpoint of architectural design and from the viewpoint of the man running a construction job. Participants in the symposium were Edgar Tyler, A.I.A., member of the architectural firm of Potter-Tyler & Martin of Cincinnati, and John Maescher, of the Cincinnati contracting firm of Charles V. Maescher Co.

"These are very demanding days for all of us who are interested in concrete construction," Mr. Tyler said, "whether we see the subject from the viewpoint of the producers of ready-mix materials, the construction contractors or the designing architects and engineers. So many new

developments have taken place in recent years and are continuing to be made public by the engineering researchers, that it keeps a man on his toes to keep abreast of the times and make himself familiar with just the bare high spots as new things develop."

Mr. Tyler referred to such terms as prestressing, rigid frame, continuity, flat plate and lightweight aggregates as examples of comparatively recent developments which have won general acceptance quite rapidly. He pointed out that these are "all familiar tools of architects and engineers now and all comparatively recent developments in practical applications of old, proven theories.

"These new applications," he said, "are the basic reasons for some of the new demands for precision in concrete and, in many types of structures, for the specified higher strengths that you come across in your daily routine."

Mr. Tyler emphasized the fact that prestressing developed first in Europe because of the necessity of conserving costly materials.

"Until recently we in America have not been pressed for economy in the use of materials and are just beginning to scratch the surface of truly economical design," Mr. Tyler said.

Must Continue to Improve

"There is another item which has caused our retarded development," Mr. Tyler continued. "The American structural designer is essentially conservative and will not be persuaded to experiment on permanent structures with the use of materials until their strength and uniformity can be demonstrated. He is right. It is awfully hard for him to explain why something he has designed falls down. So if we are to make progress in economy of design we must continue to improve the quality and uniformity of our materials."

Mr. Tyler pointed to the University of Cincinnati Field House and Armory under construction on the east edge of the campus, as "an excellent example of the economical use of reinforced concrete." He said ready-mixed concrete was being used on the project.

"The arch ribs and thin shell panels of the main roof structure span approximately 175 ft. and are being constructed with 5000 lb. concrete," the speaker said. "The 5000 lb. concrete makes the first cost economy practicable and provides the owner with a building easy and economical to maintain."

Another reason why quality concrete is essential in architectural design, Mr. Tyler said, "is that in the application of concrete as a finished architectural material we must have a material durable to the elements. Here we have learned a great deal in very recent years with the experimentation on and finally, the application of air-entraining.

"But air-entraining is not a cure-all. Where high strengths are required, the entraining of air can lead to added cost. We have had some excellent results from the weathering standpoint, on vertical surfaces by using a pozzolanic admixture with a dispersing agent and achieving economy in so doing."

Mr. Tyler emphasized the importance of slump and cylinder tests and an accurate check on the moisture content of aggregates. "On one recent project, remote from Cincinnati," he said, "where we had specified 3750 p.s.i. compressive strength at 28 days and had approved a designed mix on a 6.3 sack basis, which should have produced the required strength, the test cylinders repeatedly failed to come up to strength. We were forced to require the contractor to increase the cement content to 6.7 sacks per yard until an economical mix with the material at hand could be arrived at. In addition we had to have test loading applied in the area where the cylinders indicated the strengths were low. This all costs money and time.

"We didn't know all of the contributing causes in this instance but, since most of the low test cylinders were taken on Fridays and in very hot weather, it can be reasonably supposed that the cylinders were neglected. More thorough investigation showed that wet pit sand and gravel were not being drained as specified and that the producer of the ready-mixed concrete did not do any measuring of the surface water on his aggregate.

"On large work, our office generally specifies a given compressive strength in p.s.i. at 28 days, a maximum aggregate size and slump limitations for each class of concrete. We think this is reasonable practice. We require preliminary test cylinders on designed mixes prior to extensive pouring and ample safety factors on cement content in pours made prior to approval of designed mix."

Contractor's Viewpoint

John Maescher of the Charles V. Maescher Co., Cincinnati building contractors, gave the contractor's viewpoint of why quality concrete is essential on the construction job.

"You fellows have control of the cost of concrete," he told the ready-mixed men. "Everlasting vigilance is required at every point."

Mr. Maescher stressed the fact that excessive slump may mean rejection of a batch of concrete and consequent delays. He was especially emphatic about the urgency of avoiding delays in deliveries of ready-mixed concrete. He cited a number of actual instances in which disruption of delivery schedules had held up large projects and kept dozens of building craftsmen idle while costs piled up.

As a preliminary to the showing of Part I of the Portland Cement Association's sound and color motion picture, "Quality Concrete," Prof. Wandmacher spoke briefly on the importance of careful grading of aggregates and an accurate check on moisture content.

Laboratory Demonstration

The final afternoon program feature following the showing of the film was a 2½ hour demonstration in the laboratory of mixing, proportioning, making slump tests and casting cylinders and cubes. This demonstration was conducted by Prof. Wandmacher assisted by three teams of pre-junior students in Civil Engineering.

Materials Symposium

Ralph H. Anderson of the Anderson Concrete Corp., Columbus, presided at the morning session on the second day, Thursday, Jan. 14. A symposium on the general subject, "Materials For Concrete," was a feature of the morning program. Speakers were H. G. Wood, district manager, Portland Cement Association, Columbus, who discussed "Aggregates and Cement for Quality Concrete," and Robert J. Korderbrock of the Vermiculite Institute, Cincinnati, who spoke on "Lightweight Aggregates." Mr. Wood used slide pictures to illustrate his talk. Mr. Korderbrock used a blackboard for formulas.

Mr. Wood discussed in detail such phases of his subject as the weights of various types of concrete; aggregates found in Ohio; how to test aggregates for soundness; how to stockpile aggregates, and characteristics of various types of portland cement.

Lightweight Aggregate

Mr. Korderbrock, who took the rostrum for the lightweight aggregate side of the symposium, declared that because of the increasing use of lightweight aggregates it has become necessary to inform the ready-mixed concrete industry on the fundamentals of producing a quality lightweight insulating concrete. The speaker's remarks had specific reference to vermiculite.

"As you no doubt know, every type of quality concrete has its limitations," Mr. Korderbrock said. "The same is true of lightweight vermiculite insulating concrete. It too has its limitations. So in order to give you a clear picture and to avoid any exaggerated claims or statements, I have segregated my discussion into three separate categories: (1) Why is vermiculite insulating concrete used? (2) What is it used for? (3) How to produce quality and quantity vermiculite concrete."

On why this material is used, the speaker said vermiculite concrete "weighs as little as 25 to 35 lb. per cu. ft., or one sixth as much as regular types of concrete." He asserted that it has a high insulating value, is unburnable and permanent.

Of the uses of vermiculite concrete, the speaker said, "Its main use is as an insulating roof fill. Also it is used

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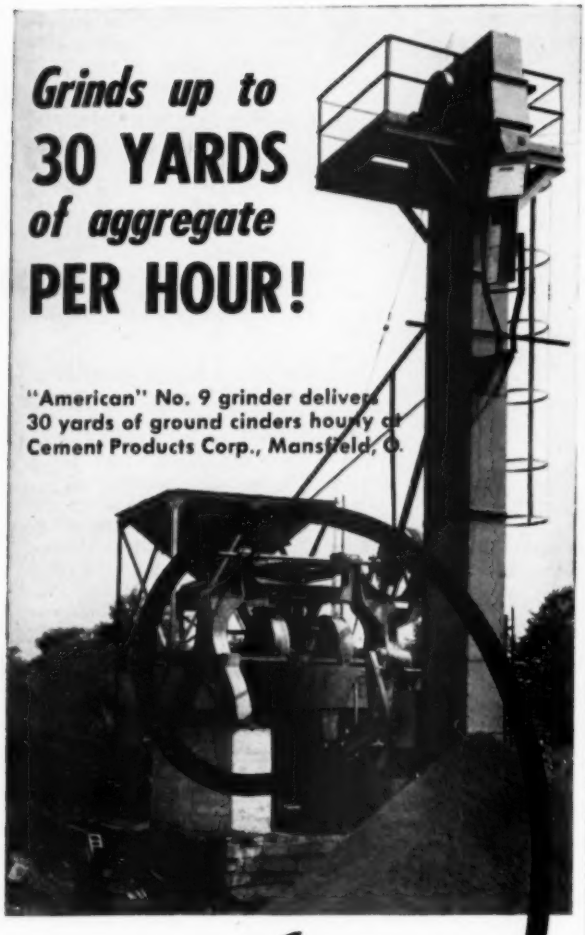

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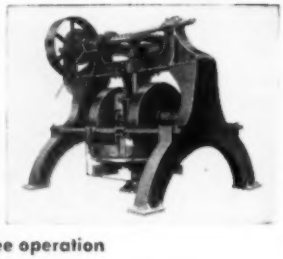

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as a short span structural roof deck over such typical forms as a paper back welded wire mesh, a high ribbed metal lath or supporting forms of asbestos-cement, gypsum or fibre board.

"It is used as a floor fill over other materials. It is used as a base on which radiant heat coils are placed. It is used as a slab on grade."

Other papers on the Thursday morning program were given by E. W. Cummins and J. F. Barbee, both engineers from the Testing and Research Laboratory of the Ohio Department of Highways. Mr. Cummins discussed "Water-Cement Ratio," and Mr. Barbee talked on "Air-Entrainment."

Old Concrete Air-Entrained

Although air-entrained concrete is listed as a new development, Mr. Barbee declared that much concrete placed years ago has been found to be air-entrained, although that fact was not known at the time of placing. He asserted that the famous concrete pavement in Bellefontaine, Ohio, built in 1893, was air-entrained.

Prof. Wandmacher presided at the opening of the Thursday afternoon session. As a preliminary to the scheduled field trip to the Ohio River Division Laboratories of the U. S. Army Corps of Engineers, a symposium on "The Role of the Laboratory in Producing Quality Concrete," was presented. Members of the panel were Frank M. Mellinger, director of the laboratories, assisted by R. E. Barnett, I. Narrow and B. U. Duvall of the Corps of Engineers staff.

Work of Engineer Corps

Director Mellinger said the purpose in assembling the panel was to show the scope of the work of the laboratory in producing quality concrete for construction by the Corps of Engineers.

Mr. Narrow and Mr. Barnett discussed, "The Investigation of Aggregate Sources." Mr. Duvall talked on "The Requirements and Tests of Concrete Materials Other Than Aggregates." Mr. Narrow also spoke on "Design and Control of Concrete Mixtures."

"The role of the laboratory in the production of good quality concrete begins with the investigation and testing of the materials used in the concrete mix," Mr. Narrow explained. "The aggregate which comprises about 75 percent of the volume of the concrete, is probably the most important factor in determining the quality of the concrete."

The speaker said that in the Ohio River Division Laboratories the investigation of aggregate sources is conducted in three separate phases: field reconnaissance, condition survey of structures and laboratory studies of aggregate samples.

Mr. Barnett described the many items to be considered in a reconnaissance of sources af aggregates and explained the uses of magascopic and microscopic examination and use of binocular and polarizing microscopes.

Mr. Duvall, discussing tests of concrete materials other than aggregates, said that all portland cement used on Corps of Engineers projects is tested either in the laboratories of the Corps or by the National Bureau of Standards. This testing, he said, is part of the quality control of concrete. The laboratory also tests all admixtures which may be proposed for use on any Corps of Engineers projects.

Mr. Duvall called especial attention to the fact that water which is satisfactory for drinking may not be desirable for mixing concrete, and that water acceptable for use in concrete may not be desirable for curing.

"Many times, water which is entirely satisfactory for human consumption," Mr. Duvall said, "contains appreciable amounts of soluble iron compounds which may cause considerable staining of the concrete and present an unsightly surface appearance."

The speaker warned that because of the success and general acceptance of curing compounds, many inferior products offered for this purpose have appeared on the market recently. These he said, have been sold on a price rather than a quality basis. He said this situation had required the Corps of Engineers Laboratories to do much testing to insure proper quality of curing compounds. Further, he said, laboratory personnel had been obliged to train field personnel in the proper use of curing compounds.

Laboratory Inspection

At the conclusion of the symposium, those in attendance boarded special buses and were taken to the Ohio River Division Laboratories at Mariemont, an eastern suburb of Cincinnati. At the laboratories the party was divided into small groups to facilitate handling by guides. Sections visited included the geology and chemical laboratories; freezing and thawing rooms; fog room; aggregate laboratory; mix design laboratory and crushing and screening room.

Association President, James A. Nicholson, was toastmaster at the banquet held Thursday night in the ballroom of the Sheraton-Gibson Hotel. Dr. Samuel Marble, president of Wilmington College, Wilmington, Ohio, was the guest speaker. In addition to Mr. Nicholson and Dr. Marble, those at the speaker's table were: Charles O. Dittrich, Samson Crew, H. G. Wood, R. P. Mumford, Ralph H. Anderson, Carl F. Shoaff, L. A. Kemter and Prof. Cornelius Wandmacher.

Samson Crew was chairman of the morning session on the third and final day, Friday, Jan. 15. The second part of the Portland Cement Association's quality concrete film was run with half of those enrolled for the short course viewing the film while the others were in the laboratory where Prof. Wandmacher showed how concrete cylinders are capped and tested and the results tabulated.

At the conclusion of the laboratory demonstration, George B. Southworth, assistant general sales manager of Master Builders Co., Cleveland, delivered a paper on "Design of Concrete Mixes."

Says Water is Abused

Mr. Southworth asked his audience to consider concrete as having five ingredients which he listed as coarse aggregates, fine aggregates, portland cement, water and air. He said he considered the coarse aggregates to be the most important. Water, he said, is the most abused ingredient.

"Few of us in the mixing and placing end of this complex business give enough consideration to water," the speaker said. "It's convenient, it's cheap, and it is nearly always more available than our other ingredients. Your industry could contribute a major improvement to all construction by charging 15 cents per gallon for water which is just what it costs you to add enough cement to offset the damaging influence of one gallon of water. Water is the only material in our mix which affects every single quality we are striving to secure. In its relation to the cement content it influences strength, both compressive and flexural, and has a contributing influence on durability, watertightness and wear resistance. In its relation to the concrete mass itself, it has an effect on shrinkage, durability, watertightness, density and any other quality you may mention."

Concrete Problems

At the closing session, Friday afternoon, Jan. 15, Stanton Walker, Washington, D. C., director of engineering of both N.S.G.A. and N.R.M.C.A. was the featured speaker. He discussed, "Problems of Sampling, Molding, Handling, Curing and Testing Concrete Specimens." In introducing the speaker, Mr. Mumford said that Mr. Walker had long been known as "Mr. Concrete," because of his many years of technical work with cement and concrete.

"Recommended practice," Mr. Walker said, "represents a compromise between conflicting ideas. The auxiliary function of mixing concrete has become extremely important. Ready-mixed concrete is produced on a prescription basis. It accounts for at least 25 percent of all the portland cement used. It is becoming more important because of the present trend toward specifying strength in ordering concrete.

"But a specification based on strength alone gives many opportunities for unethical operators to chisel. Also many gross inaccuracies occur in determining the strength of concrete. Tests are often not well done and many controversies result from lack of realization on the part of

(Continued on page 198)

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Ready Mix Job Problems

(Continued from page 188)

(with five brands of cement) average strengths of 3,250, 3,650, 3,820, 4,430 and 4,750 p.s.i. The differences in these figures represent a sack of cement per cubic yard.

In these cement-shortage times, a high volume producer may have to use as many as four or five brands of cement in a day's work. Mr. Howard points out that a concrete producer, operating under such conditions, should use a conservative w/c ratio and should avoid the combining of light and dark cements which might lead to discoloration, flash set, excessive shrinkage, changing slumps and a range of high to low strength results.

A producer should have a fair knowledge of the properties of cement. He should know that some brands of cement vary considerably in characteristics. Cements vary from plant to plant and on some occasions, even within operations. No two cements are completely alike. Strength, durability, air content, slump, appearance and other characteristics of concrete may be directly affected by the brand of cement which is being used. Even though all cements, distributed in a market, undoubtedly meet specifications, care should be taken that intermingling of cements doesn't cause trouble. At ready-mixed concrete plants, where different brands of cement are being used, the solution to the problem of erratic results may be found by improving cement handling practices.

Mr. Howard has also brought to the attention of the ready-mixed concrete industry, consideration of the possible dangers involved in using hot cement in warm, drying weather. Among the problems of hot cement—hot weather concrete, he lists reduced time for working the concrete, interference with proper hydration, general lowering of strength results and increased number of cracks in concrete.

The changing of cement brands can also become an important consideration in the problem of air entrainment. One air entraining cement might produce an average air content of 4½ percent. With another brand, a 7 to 9 percent average might develop, coupled with low strength reports. Comparable results might be similarly obtained by adding a given quantity of an air entraining agent to regular cements of two different brands. Unquestionably, some concrete producers have avoided air entrainment because of these variations in cement behavior.

The efficiency of present tests to adequately determine the quality of cement has been brought into question. As has been expressed about aggregate, the feeling is rather widespread that tests do not clearly indicate how cement will behave in concrete. It is suggested that cements should be tested within the range of the w/c ratio in which they will be used. How a cement will behave within limits of a w/c ratio is what should be determined in advance. A basis for this suggestion is found in certain findings by E. H. Howard. In using different brands of cement to get 3,500-lb. concrete, it was necessary to vary the net w/c ratio (by weight) from .57 to .71; similar variations occurred in attaining other strengths.

Variations in compressive strength of concrete possibly traceable to the cement include the following:

1. *Fineness*—fineness apt to go down in a high production year.

2. *Flow Table Characteristics*—to obtain a certain flow, does cement require 5 gal. of water or 6 gal. of water? If cement requires additional water, so will the concrete and strengths will show a corresponding decrease.

3. *Air Content in Regular and Air-Entraining Cements as Determined by the Burmeister Test.*—There is certainly a possibility of some strength variations dependent on the care taken in adding the air-entraining agent at the cement plant. At times of peak production and low inventories, considerable difficulty may be experienced in maintaining air contents within a close range. A possible variation may be due to length of time cement is kept in the silo (no reliable tests known to be available.) The same air content in two cements may have different effects on strength.

4. *Chemical Characteristics*—High content of tricalcium silicate and lime leads to good strength results. A factor that might cause variations is the quality of the coal; lack of proper burning adversely affects the chemical constituents of the cement clinker.

Over the years, personnel of many associations have been generally helpful in our industry's efforts to set up and maintain high operating standards. Of all the organizations that have actively assisted this industry, The Portland Cement Association is most highly considered by architects, engineers, builders, property owners, testing laboratories, governmental agencies, highway boards, and large corporations. In some quarters, the P.C.A. is given a ranking comparable to the general esteem accorded a Supreme Court. Furthermore, the P.C.A. has efficient, highly trained field engineers, strategically located in most parts of the United States, who are continually working in behalf of the cement industry.

Alert ready mixed concrete producers use these men by getting their assistance in solving operating problems, obtaining sales and promotional ideas, improving concrete quality and ferretting out causes of trouble when concrete fails to perform as expected.

It is to the mutual interest of both the cement and ready-mixed concrete industries that the high standing of

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Simple, efficient design permits quick access to every part for faster, less costly maintenance. The bigger charging cone allows faster charging . . . 8 to 10 seconds per yard of concrete being batched! The new Trukmixers have been field tested by ready-mix operators for over a year!

You'll have to see these new 5½-yd. and 6½-yd. Hi-Boy Trukmixers to believe that any manufacturer could include so many practical, profitable features in one unit. Ask for a complete description today!

WEIGHT ON THE ROAD OF JUST A FEW TRUCKS WITH THE 5½-CU. YD. HI-BOY LOADED WITH *5½-CU. YDS. NORMAL CAPACITY AND **6-CU. YDS. GUARANTEED MIXER CAPACITY

Truck	Model	Wheel base	Weight in lbs. on front axle		Weight in lbs. on rear axle		Total Weight in lbs.	
			*5½-yd.	**6-yd.	*5½-yd.	**6-yd.	*5½-yd.	**6-yd.
Mack	B-425	182½"	13,787	14,177	30,461	31,888	44,248	46,065
White	WC-2264	178"	12,405	12,980	30,675	32,017	43,080	44,897
IH	RF-192	175"	11,360		31,592		42,952	
Reo	F-226M	170"	12,795	13,218	29,713	31,315	42,508	44,533
GMC	W620-42	183"	12,183	12,512	30,425	31,913	42,608	44,425
Ford	T-800	175"	9,761		31,384		41,145	

NOTE—*Weights shown are for mixer in same position on truck for both size batches, and include flush water and gas for mixer.*

See your BLAW-KNOX distributor for details

Ask about the "Complete Ready-Mix Package"

It contains everything you need for fast, profitable operation . . . batching, charging or mixing plants, clamshell or concrete buckets, plus the new 5½-yd. or 6½-yd. Trukmixer, or smaller Hi-Boys.

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
Farmers Bank Building
Pittsburgh 22, Pa.
Offices in Principal Cities

BLAW-KNOX

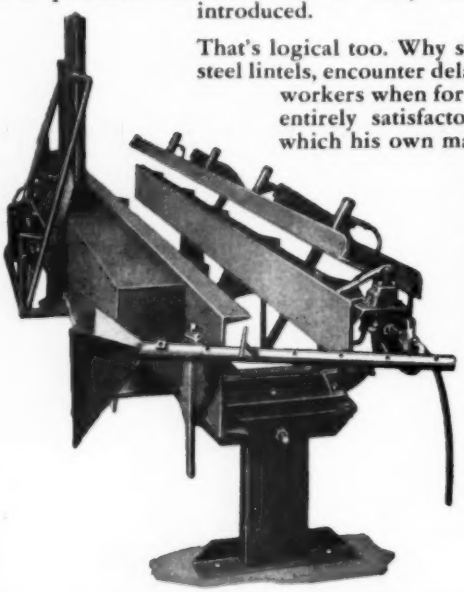
NEXT IN IMPORTANCE TO YOUR BLOCK MACHINE

Assuming that your mixer and block machine are working smoothly to your entire satisfaction, a logical question is what you can do next to increase your volume of sales.

One sound step in this direction will be to make concrete lintels and sills. Some producers have made them by slow, hand methods in more or less crude forms. But today, more and more concrete producers are making them better, faster, at less cost on the

KENT LINTELATOR

This is a highly efficient machine, the only one available for the purpose, which combines vibration and pressure to make superior products that have found ready acceptance wherever introduced.



That's logical too. Why should a builder use steel lintels, encounter delays and engage steel workers when for less cost he can get entirely satisfactory concrete lintels which his own masons can install.

There's something timely for you to consider. And if there is any question as to the efficiency of your mixing and block making equipment, the logical thing to do is investigate KENT Continuous Mixers and the KENT Blockmaker also.

Write today!

•

The KENT MACHINE COMPANY

CUYAHOGA FALLS, OHIO

Manufacturers of

CONCRETE PRODUCTS MACHINERY SINCE 1925

the Association and the integrity of its field engineers be zealously maintained. Ready-mixed concrete operators should never, under any circumstances, attempt to get representatives of this association (or any other association) or consulting engineers to "cover up" for their mistakes. Nor should the cement industry ever attempt to use a highly considered field representative as a shield for an erring cement manufacturer. The truth, if discernible, should be laid on the line. There is too much at stake for any one to jeopardize this confidence and trust.

In the matter of assisting ready-mixed concrete operators and other customers, to solve job problems, cement manufacturers apparently have different attitudes as to their responsibilities. The more progressive cement manufacturers have alert efficient service-engineers who work closely with customers in solving day-to-day problems. Other manufacturers depend almost entirely upon the services of P.C.A. representatives. In some cement shortage areas, a few manufacturers have been reported as treating these problems with seeming indifference. However, before we in the ready-mixed concrete industry become overly critical of others, we should make certain that we are capably handling our own responsibilities.

Concrete Drain Pipe

WALKER CEMENT PRODUCTS CO., Poroswall Pipe Div., Little Ferry, N. J., has announced publication of a new catalog, "Poroswall Drain Pipes," which will appear in Sweet's Architectural File for 1954. Copies are also available from the company.

The pipe, which are made in sizes 4 to 24 in. internal diameter, are designed specifically for ground drainage and leaching. By a special process developed over 25 years ago, the concrete drainage pipe is said to achieve its unique porosity through thousands of minute channels too small to allow the passage of anything but water. It is designed with a self-sealing slip joint requiring no mortar. The catalog describes the pipe's composition, physical properties, advantages and uses.

NOW MORE THAN **140** *LICENSED MANUFACTURERS* ***Producing***

Patented

homeward *Concrete* **STEPS**

A Small Investment That Pays Big Dividends

Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open.

For Complete Information Write

ROGER F. WILLIAMS, Licensor

3420 S. W. 9th St. Des Moines (15), Ia.

CONCRETE BURIAL VAULTS

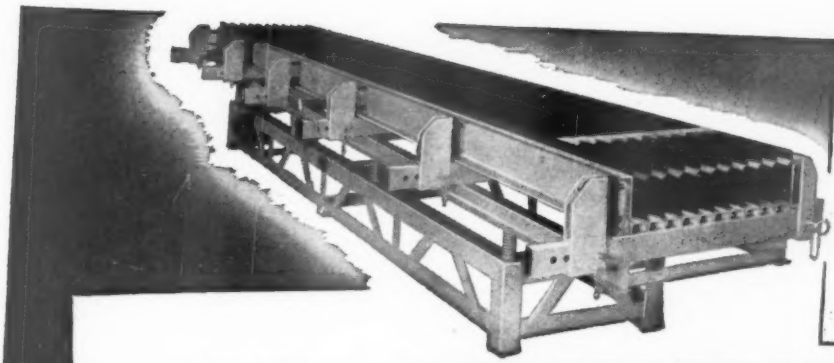
AMERICA'S FINEST MOLDS AND LOWERING DEVICES

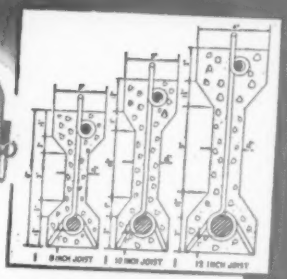
TERRITORY FRANCHISES

BERG VAULT CO.

EQUIPMENT DIVISION

1820 LUCAS HUNT RD. ST. LOUIS 20, MO.





. . . ADD A NEW PROFIT-MAKER!
INCREASE YOUR VOLUME

Only small investment required!

The addition of the Kirk & Blum Vibrating Table to your present equipment requires a very small initial cost, enables you to make an entirely new line of 8", 10" and 12" joists in 20 and 24 ft. lengths.

Produce money-making concrete joists with the Kirk & Blum Heavy Duty Vibrating Table . . .

Cash in on the ever-growing demand for steel-reinforced concrete joists. Your experience and contacts in the building trade should make it easy to build up a profitable business in this new line. Concrete joists are simple to make, have unusual strength, are termite proof. The KIRK & BLUM Type "S" Heavy Duty Vibrating Table is capable of multi-production of concrete joists, allowing a fine profit-margin. Easily produced by unskilled operators. For complete details and prices, write to The Kirk & Blum Mfg. Co., 3210 Forrer Street, Cincinnati 9, Ohio.

KIRK AND BLUM

Manufacturers of steel forms of all types . . . Curb, Gutter, Sewer, Road

ROCK PRODUCTS

HAS THE LARGEST ABC CIRCULATION AND HIGHEST RENEWAL PERCENTAGE IN THE NON-METALLIC MINERALS INDUSTRY

PRASCHAK AUTOMATIC 400

- **AUTOMATIC** capacity of 400 blocks/hour
- **PRESS HEAD** pressed top blocks
- **TAMPER** tamped at rate of 200 blows/minute
- **VIBRATION** powerful, variable, yet smooth
- **LOW PRICED** $4195.00 complete

SEND FOR FULL INFORMATION

We also manufacture:

Mixers in five sizes, Bucket Elevators, Hammer-mill Crushers, Rotary Screens, Conveyors, Lift Trucks, Silo Stave Machines, Electric Off-Bearers.

PRASCHAK MACHINE CO.

MARSHFIELD WISCONSIN

"We've tried 'em all – and Clark's are easier to operate, require less maintenance," SAYS JAKE SEBERGER, SEBERGER'S CONCRETE BLOCK CO., GARY, INDIANA

Of necessity, owing to the tremendous weights involved, the manufacture of concrete blocks is a mechanized handling operation; and for Jake Seberger's money there's only one entirely satisfactory answer—Clark trucks. He operates three: 6000 lb. gas-powered Utilitrucs, one with pneumatic tires and power steering. He has three others, of different makes; but they're his "second team."

New blocks from the huge forming press (400 to 1600 per hour, depending on size) are placed manually on steel trays; then on racks —14 trays to a unit, weighing well up toward 6000 lbs; and moved into the kiln for 12-hour curing in low-pressure steam at high temperature. From the kiln, racks are taken to the shipping area for manual loading on trucks. Empty racks are returned to the block machine—a continuous cycle.

"These Clarks are the only ones for me," says Seberger. "Two of the Clarks are about 5 years old; and the only maintenance in all that time was replacement of one clutch."

You'll find Jake Sebergers in every kind of industry that handles materials—experienced men with a keen eye for savings, who have "tried 'em all" and want none but Clark.

Just as basic "good business," have a talk with your nearby Clark dealer, a competent counselor on the planning of handling methods engineered to your business. You'll find him listed in the Yellow Pages of your phone book.

CLARK EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
BATTLE CREEK 60, MICHIGAN

Ohio Short Course

(Continued from page 193)

architects, engineers, specification writers and producers that there will be a normal variation in strength and that it is necessary to set up a tolerance. The variation," he said, "depends on the degree of control.

"Getting a proper sample is the first step in testing," Mr. Walker said. "Few know how to take a perfect sample, but if you have a legal liability for strength you cannot afford to ignore the most careful procedure. Molding specimens is extremely important."

The speaker warned against the use of improper paper molds which he said often absorb water and alter the characteristics of the concrete specimen. He also warned against careless handling of test cylinders on the job. It is a simple matter, he declared, to provide protection for cylinders. He urged ready-mix men to furnish contractors with special boxes in which to place cylinders to avoid damage and rapid drying."

At the time of adjournment it was announced that another short course will be given under Association sponsorship during 1954.

Concrete Short Course

THE SECOND annual quality concrete conference of North Carolina was held recently at the State College School of Engineering at Raleigh, N. C. The conference, which was sponsored by the Portland Cement Association, North Carolina Ready Mixed Concrete Association, North Carolina Concrete Masonry Association, and the State Highway Commission, was attended by over 100 North Carolina concrete products manufacturers, construction engineers, contractors, and highway commission representatives.

Dr. J. H. Lampe, dean of engineering at the college, delivered the welcoming address. Other speakers at the 2-day meeting included: W. H. Rogers, Jr., chief engineer, State Highway Commission; C. E. Wuerpel, technical director, Marquette Cement Manufacturing Co., Chicago, Ill.; Frank G. Erskine, managing director, Expanded Shale Institute, Washington, D. C.; K. P. Bilner, president, Vacuum Concrete, Inc., Philadelphia, Penn.; Fred Van Atta, special assistant, American Society for Testing Materials, Philadelphia, Penn.; C. E. Proudley, chief material engineer, State Highway Laboratory, Raleigh, N. C.; Dr. Ralph E. Fadum, head of the Civil Engineering Department of the college; Harry McDonald, field engineer for Penn-Dixie Cement Corp., Atlanta, Ga.; J. B. Linville, president, North Carolina Concrete Masonry Association; D. L. Chaney, regional structural engineer, Portland Cement Association; and Philip L. Melville, research engineer for the Commonwealth of Virginia, Charlottesville, Va.

FAST AND CLEAN DISCHARGE of even the lowest slump concretes is made possible by the patented blade design of this Worthington Hi-Up Truck Mixer, one of a fleet owned by the McNamee Ready Mixed Concrete Co. of Xenia, Ohio.

"Drivers, shop men, customers—everybody likes our new Worthington HI-UP Truck Mixers"

Says Charles F. McNamee of the McNamee Ready Mixed Concrete Co., Xenia, Ohio

McNAMEE DRIVERS LIKE THE HI-UP because its unrestricted hopper opening keeps charging time to a minimum. Both charging and mixing are accomplished with the drum rotating in the same direction. And the engineered weight distribution of the Hi-Ups lets you carry the maximum legal payload.

Mr. McNamee goes on to say:

"We particularly like our new Blue Brutes' heavy-duty transmission and their ease of operation. Our shop men like the provisions for easy maintenance; for example, they point out the relatively few lubrication points and their ready accessibility. The drivers say the machines are unusually easy to handle and to keep clean, that they mix and discharge exceptionally well. But what makes us happiest of all is that the machines and their product are liked by our customers."

We've been getting letters like this from Worthington Hi-Up Truck Mixer users all over the country. Why not find out for yourself about these modern Blue Brutes. Get the facts from your nearest Worthington distributor, or write directly to Worthington Corporation, Construction Equipment Division, Section R.3.6, Plainfield, N. J. R.3.6

WORTHINGTON

IF IT'S A CONSTRUCTION JOB, IT'S A **BLUE BRUTE** *JOB!*

V-BELTS® QD SHEAVES® AIR COMPRESSORS® CENTRAL MIXERS® VERTICAL TURBINE PUMPS® CIRCULATING PUMPS

COMPLETE PLANTS
from a Single Source

- "Tilt-Up" Mixers
- Ready-Mix Plants
- Expressway Semi-Portable Plants
- Dry Batch Plants
- Cement Bins
- Aggregate Bins
- Cement Storage

ENGINEERED TO WORK TOGETHER

From conveyor to elevator, from bin to mixer Burmeister equipment is designed and built by the same organization. Because each product is *"engineered to work together"* you are assured less costly "conversions," maximum production speed, accurate delivery of materials, and greater economy of operation. See your nearest Burmeister Distributor or write for details.

FREE CATALOG

Send for new 16-page illustrated Catalog of Burmeister Plants and Equipment.

COMPLETE PLANTS FROM A SINGLE SOURCE

Burmeister

L. BURMEISTER CO., 4529 W. MITCHELL ST., MILWAUKEE 14, WISCONSIN

THE MOST PRACTICAL AND TROUBLE FREE TILE MACHINE ON THE MARKET

AMAZINGLY LOW PRICE

FEATURING:

- DIRECT DRIVE — NO BELTS
- NO SLIDING KEYWAY
- AUTOMATIC TURNTABLE
- SEALED PACKER SHAFT HOUSING

Machine pictured makes Drain Tile, Well Tile, T. & G., Etc. up to 24" diameter and three feet long. Larger or smaller machines available.

WRITE FOR FOLDER

MACHINERY & ENGINEERING DIVISION

NASHUA TILE CO. NASHUA, IOWA

Pre-arched Roof Slab

(Continued from page 181)

placed on a semi-trailer flat bed body, three heavy steel bars on each side, suspended from steel cable, are thrust into the previously described pipe openings in the pallet base. A lever is moved to start the hydraulic motors drawing up the pallet by means of the steel cables operating through sheaves supported from the I beams above.

From Truck to Wall

At the building site, another mobile crane, designed by the company and assembled by Hetherington & Berner Co., is used to lift the slabs from the trucks and place them directly on the walls. Suspended from the specially-designed mast of the crane is a sheave with a hook that engages a cable-supported horizontal pipe. Heavy canvas straps with triangular-shaped hooks are slipped under the slab at each end and engage steel yokes over the steel pipe assembly, preparatory to raising the slab into position on the walls. Projections welded on the steel pipe prevent slippage of the yokes on the pipe.

Rapidex slabs are being employed in a variety of outstanding structures, including schools, factories, theaters, hotels, truck terminals, and residences. When the new addition was made to the Spickelmier Co. offices, the slabs were used liberally in the roof and floor construction. Exposed surfaces made an attractive ceiling. The slabs were also used in construction of the Rapidex plant.

Officers of the company include: C. F. Spickelmier, managing partner; Chas. H. MacMahon, Jr., sales manager; H. R. Carper is in charge of production and operation of the plant, and J. L. Kingsbury is in charge of erection. Mr. Carper and Mr. Kingsbury worked out details of plant layout and design of the special equipment with the assistance of the company's engineering department.

Columbia Basin Contract

UNITED CONCRETE PIPE CORP., Baldwin Park, Calif., has received the contract from the Bureau of Reclamation for construction of approximately 23 miles of laterals, five miles of precast concrete pipeline, and concrete structures on the Columbia Basin project in Franklin County south of Mesa, Wash. The concrete pipe corporation was low bidder at $1,062,158 —the bureau engineers estimated the cost at $1,136,435.

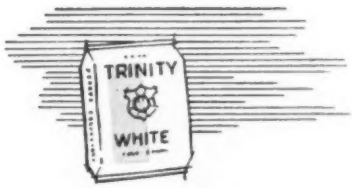
Reopens Block Plant

PRE-SHRUNK MASONRY SALES CORP., Roanoke, Va., has rebuilt and resumed operation of its cinder block plant. The plant had been closed since July, 1950, when a plant accident had destroyed or damaged all major equipment. The new plant has a capacity of 18,000 block per 24-hr. day. Owner of the company is M. W. Ferguson.

USE Trinity White

PORTLAND CEMENT

the whitest white cement



Trinity White is a true portland cement and has unexcelled beauty—the beauty of the whitest white . . . plus the best possible results when color pigments are added. Use it wherever you want greater masonry beauty or higher light reflection as for example: architectural concrete units; terrazzo; stucco; light-reflecting floors and walls. For descriptive literature, write Trinity White Cement, 111 W. Monroe St., Chicago.

A Product of GENERAL PORTLAND CEMENT CO. • Chicago • Dallas • Chattanooga • Tampa • Los Angeles

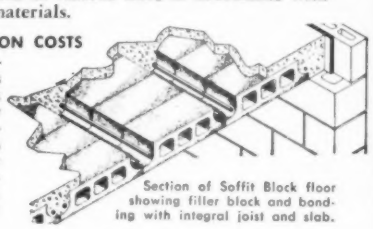
"I Find BOTH Profitable"

VIBRAPAC Block and SOFFIT Floor and Roof Filler Block

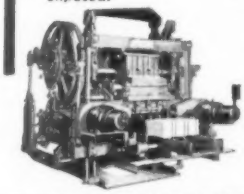
Vibrapac block plants are now adding to their profits by manufacturing Soffit Filler Block for floors and roofs. These units assure permanent, fire-safe construction, at low cost. Soffit Block provide maximum acoustical and insulation values with natural base for radiant heat installations. Made in various sizes to coordinate with other modular materials.

CUTS CONSTRUCTION COSTS

Temporary adjustable steel centers support Filler Block while slab and joist are curing. Conventional shoring is eliminated. The smooth, flush surface can be plastered, painted or left exposed.



Section of Soffit Block floor showing filler block and bonding with integral joist and slab.



BESSER VIBRAPAC

Vibrapac Block for walls, floors and roofs, in all styles and sizes, are made on a Besser Vibrapac, using one set of Plain Pallets. Fully automatic. No machine operator required. Write for descriptive literature.

BESSER MANUFACTURING CO.
ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Products Plants

—Sh-s-s-h!—

Are you open to deal in lucrative

Underground Activities?

BIG PROFIT MANUFACTURING Cement Drain Tile

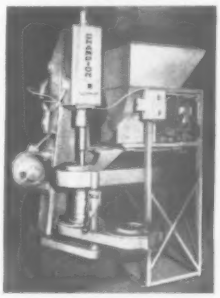
Farm drainage—home building—reclamation projects—highway construction. From these and other sources comes an ever-growing demand for drain tile. More local plants are urgently needed.

It's a wide-open opportunity. Either as an independent, full-time business or as a profitable addition to other concrete products.

CHAMPION Drain Tile Machine

Champion-made tile are dense, strong and truly round. Far superior to clay tile—worth more but can be sold for less without sacrifice of profit.

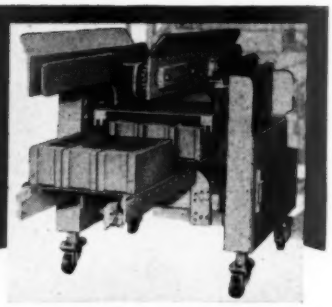
Champion machine makes manufacturing easy. With automatic feeder it becomes 1-man operation. Makes all sizes up to 12", yet requires only a modest investment. Write for the Drain Tile Book.



CONCRETE EQUIPMENT CO.
562 Ottawa Ave., Holland, Michigan

BERGEN FRONT PALLET RETURN

Feeds Pallets OVER outcoming block!



Detachable to roll away in 30 seconds!

- Takes 18-1/2 x 26" or 19 x 27" pallets
- Adjustable for block heights-3-1/2 to 9-1/8"
- Can't be fouled by falling concrete
- Eliminates pallet chain conveyor ass'y

May be used on Besser Vibrapac

Write for bulletin

BERGEN MACHINE & TOOL CO., INC., NUTLEY, N. J.

SAVE FUEL • REDUCE CURING TIME • CUT COSTS • UP PROFITS with *Standard* KILN DOORS!

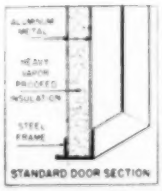
● This is the modern STANDARD kiln door installation of Portland Industries Inc., Riviera Beach, Florida. C. R. Wilson, the firm's Executive Vice President, writes: "Our Standard kiln doors have been very satisfactory."

To suit your individual requirements, three types of STANDARD kiln doors are available—the sliding carrier-type (shown above), the top hinge-type (which is pulled up by a hoist), and the side hinge-type.

CHECK THESE FEATURES

√ Heavy Aluminum Sheets on Both Sides of Thick Vapor Proofed Insulation.

√ Rugged Steel Frame.

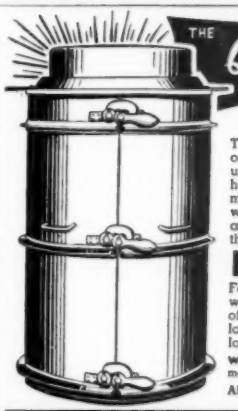


STANDARD DOOR SECTION

Get the Best — Send for Details Now

STANDARD DRY KILN COMPANY

798 S. HARDING ST. . . . INDIANAPOLIS 21, IND.



THE *Quinn Standard*

FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.

Also manufacturers QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1603 12TH ST. BOONE, IA

EASY TO USE! *Butt Weld* **EASY TO SELL!**

DUR-O-WAL

WITH TRUSSED DESIGN

The Backbone of Steel for EVERY masonry wall. Dur-O-waL is the electrically-welded, custom-designed reinforcing member that lies flat in the mortar joint. Saves you time and money, protects against cracks. Easy to sell because it's easy to use.

- **Dur-O-waL Products, Inc.** P. O. Box 628 Syracuse 1, New York
- **Dur-O-waL Division** Frontier Manufacturing Company Phoenix, Arizona
- **Dur-O-waL Div., Dept. 656** Cedar Rapids Block Company Cedar Rapids, Iowa
- **Dur-O-waL Products of Alabama, Inc.** P. O. Box 5446 Birmingham 7, Alabama

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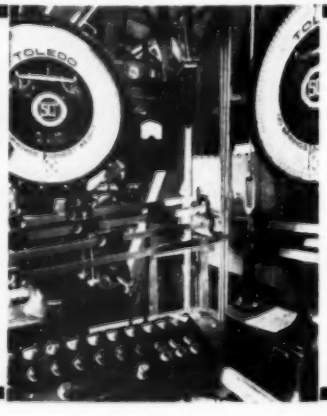
[SC]² CONTROL

An important factor in developing large scale commercial ready mixed concrete in

CHICAGO



Insures QUALITY CONCRETE

Three large (SC)2 equipped central-mix plants of the Material Service Corporation, Chicago, are now in production. A fourth plant, to be similarly equipped, is under construction.

These modern automatic plants use the latest equipment and methods for producing high quality concrete. The "heart" of these plants is the (SC)2 Control which provides precision weighing, quick moisture tests, automatic compensation for the moisture content of aggregates and an automatic record of the delivered weight of each ingredient in every batch.

(SC)2 Batching Control Assembly showing push buttons and signal lights for all weighing operations.

WRITE FOR INFORMATION

SCIENTIFIC CONCRETE SERVICE CORP.

724 Salem Ave., Elizabeth 3, N. J.

GRAVEL DEPOSIT AVAILABLE AS JOINT BUSINESS VENTURE

Gravel Deposit of 23 Acres Available 25 Miles from Boston
20 Acres More Under Option
70% Stone–30% Sand–Meeting Highest Tests

Thompson & Lightner reports available

WANTED

TO PURCHASE AND OPERATE ON A 50-50 BASIS SAND AND GRAVEL CRUSHING AND WASHING PLANT — NEW OR USED — WITH 2 CRUSHERS TO PRODUCE 600 TO 800 TONS DAILY.

Property located on Route 85 in Southboro. Three miles from Framingham line.

WANTED ALSO

A READY-MIX CONCRETE COMPANY TO SET UP PLANT ON OUR PROPERTY, ON RAILROAD SIDING, 1 MILE FROM DEPOSIT, TO WHOM WE WILL SELL AGGREGATE ON LONG TERM BASIS.

Tests and borings assure 800 gallons of water per minute. All zoning laws and necessary permits complied with.

Have you any good crushers, bins, shaker screens, conveyors or belting for sale?

New proposed Toll Road to pass within 400 yards from our deposit. Centrally located twenty miles from Newtonville, Worcester, Waltham and Franklin.

Large deposit suitable for Hot Top Plant. Ideal location for concrete pipe yard, also concrete block plant.

THE MASSACHUSETTS TURNPIKE AUTHORITY & MASSACHUSETTS DEPT. PUBLIC WORKS HAVE ACCEPTED (DEC. 2, 1953) PLANS. BIDS WILL OPEN SOON.

Ideally located for furnishing materials for Toll Road.

Also 60 acres of fill on site of proposed Toll Road

FRAMINGHAM SAND & GRAVEL CO., INC.

83 CONCORD ST., FRAMINGHAM, MASS.

Tel. Wellesley 5-2044 Evenings

WHERE TO BUY

SPACE HEATERS

War Surplus Bargain

New — Ready To Use!

40,000 BTU capacity

—Burning gasoline, kerosene or diesel fuel.
—Electric blower—12 V. DC or 110 V. AC using small transformer which we furnish with each heater.

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

$95.00 each

Clapp, Riley and Hall Co.
14 No. Clinton St.,
Chicago 6, Illinois

WANTED: Septic Tanks that need cleaning!

BIONETIC is a safe, sure, economical method.
Cleans sewage solids from tank.
Eliminates odors.
Cleans tile fields, prevents plugging.
Cleans grease traps.
Harmless to humans and plumbing.

BIONETIC at $4.25 per pound, or case of 12 one pound containers $48.00, 25 pound drum $3.25 per pound.

Some Dealer and Distributor Franchises open.
Advisory Service, write us.

P. O. Box 6724, Dept. CPM — RELIANCE CHEMICALS CORPORATION — Houston 5, Texas

NEW AND USED EQUIPMENT BUYS

1—GoCorp Twin Block Machine, power offbearer, compressor, 4", 8", 16" Chim. Attach. 9,000 Modular pallets, 58-60 block racks.
1—Fleming 180 Automatic, Hydraulic unit, pressure head, 2800 plain pallets, 9 molds.
2—Stearns Clippers with pallets.
1—Clipper 4" Attach. with pallets.
7—New Brick Machines, 7 per cycle.
1—Universal Automatic Tamper, 4"-8" with 2000 pressed steel pallets.
5—Automatic Curing Units with cycle and moisture controls.
1—15 yd. Aggregate Bin with batcher, elevator, bucket type chain driven with power.
1—12 Cu. Ft. Stearns Batch Mixer with liners, clutch and power.
1—Kent agg. conveyor with power.

MASONRY EQUIPMENT & ENGINEERING COMPANY
1001 N. Wood St., Three Rivers, Michigan
Ph. 33285

STEARNS JOLTCRETE NO. 9

Good running condition. Making Block Daily. Cast aluminum Pallets. All Modular Sizes.

2536—8x8x16
1389—12x8x16
2849—6x8x16
3379—4x8x16

Supply of Repair parts. Will sell at a bargain — Make offer — For quick sale.

STEWART - NATTINGER, INC.
Clinton, Missouri—Ph. 102

USED BLOCK MACHINES

I have a rather complete line of used block machines located in different sections of the country, mostly plain pallet such as Fleming, Lithibar and Multiplex. Some Joltcretes and George machines, and some very excellent Columbia 2-2½ or 3 block machines which barely show any wear and are being replaced only due to the owners feeling the need for the 12 in. high mold box for specials on the new 1954 model Columbia. Also I keep track of "hot spots" or boom areas to set block plants and list some money-makers for sale.

MID-WESTERN CONCRETE EQUIPMENT CO.
Box 646, Mukwonago, Wisconsin

CONCRETE BLOCK PLANT BUSINESS FOR SALE

Profitable going concern in thriving southwestern city. Sales about $600,000 per year. Price reasonable in relation to earnings and net worth.

BOX M-12, CONCRETE PRODUCTS
309 W. Jackson Boulevard
Chicago 6, Illinois

FOR SALE

1 Model 431 Smith 56S

TILTING MIXER

Equipped with charging chute, air tilt and 30 H.P. 440 Volt 3 phase 60 cycle motor. Used one year, good condition.

Price $4500.00. Loaded on car.

CERTIFIED CONCRETE, INC.
3868 Michigan Ave.
East Chicago, Ind. Ph. 2835

CEMENT COLORS

Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 50 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.

manufactured by

LANDERS-SEGAL COLOR CO.
73 Delevan St. — Brooklyn 31, N. Y.

Attachments for sale for a Model L3 (2 Block) Lith-I-Block Machine, 4" Slab Attachment with Core Bars, 10" Attachment, 6" Attachment, Sill Attachments, Birk Attachments, Split Rock Attachment.
A 28 Stearns Mixer complete with new lines, in good condition.

CHRISTENSEN CONCRETE PRODUCTS
P. O. Box 701, Grand Island, Nebraska

FOR SALE

Hydraulic, Automatic Block Machine, 3 at a time; Half Height or full quick changeover, $6,000.00. Stearns 28' Mixer, 20 HP 220V, 3PH Motor, $1,000.00.

CONCRETE PRODUCTS COMPANY
Rt. 5, Box 65, Tucson, Arizona

FOR SALE

Fork and platform power lift trucks, used and guaranteed factory rebuilts.

ERICKSON POWER LIFT TRUCKS, INC.
1401 N. E. Marshall St.
MINNEAPOLIS 13, MINNESOTA
Phone—Geneva 0397

Five—5 H.P. Electric Motors, Stearns Brake Shoe for use, Besser Vibrapac. Vibrating Shaft and Drive; Screen cloth, 5/16", ½" Square, ⅝", 3' x 4' and 4' x 5' Tyler Ty-rod. New.

ROCK-CRETE CORPORATION
343 Broad Ave., Ridgefield, N. J.

FOR SALE

Ready Mix and Cement Block Plant, crushing and washing and life time supply gravel. No competition 30 to 40 miles. No labor unions. Details on request.

WEEKS CONCRETE PRODUCTS
Wautoma, Wisconsin

NATURAL LIGHTWEIGHT AGGREGATE

Ideal for Colored Split Brick. As low as $1.00 per cu. yard. Certified quality, low freight rates.

PUMICE INCORPORATED
P. O. Box 517, Idaho Falls, Idaho

FOR SALE

Dunbrik Brick Machines, pallets, welded racks, extra parts, good condition, extremely low prices. Inquire

W. F. COLE
3557 Shelmire Ave.
Philadelphia 36, Pa.

L E A P franchises available

for the manufacture of Lakeland Engineering Associates Prestressed Concrete Products, using pretensioned bonded small diameter cable in 300 foot long casting beds, for the manufacture of beams, roof slabs, and floor slabs capable of carrying greater loads, longer spans, having greater fire resistance, lower maintenance and competitive costs.

Lakeland Engineering Associates, Inc.
Lakeland, Fla.

NOW AVAILABLE

To Concrete Block Producers

Liners and Cores. Outlasting Others by 3-1. Write Today—

LIN-COR
P. O. Box 723, Arcadia, Calif.

HEATER, Industrial gas, oven or dryer, Premix #37, 500,000 BTU, 1000 CFM, complete with controls. Excellent condition—**$350.00.**

FLACK EQUIPMENT COMPANY
Dayton, Ohio

FOR SALE

3—1951 Hilo #225 Concrete Transport Co. mixers mounted on 1951 2-ton Chevrolet trucks. Excellent condition. Priced right.

MODAHL AND SCOTT, INC.
917 E. Grove Street, Bloomington, Ill.
Ph. 5265

ALSO SEE WHERE TO BUY ADVERTISING ON OTHER EQUIPMENT IN ROCK PRODUCTS' GENERAL SECTION

APPLEY BLOCK MACHINE
(COMPLETE WITH)

25 metal racks.
1400 (8x8x16) Steel Pallets.
94 Aluminum Pallets.
Double Bull Nose Sash Attachment.
100 Double Bull nose sash Pallets.
Bull Nose Attachment.
300 Bull Nose Pallets.
315 (8x12x16) Foundation Pallets.
Package Price $2500—used, but good condition.

Interested in purchasing used 4 inch Bell-type Concrete Tile Machine.

DALMO CEMENT PRODUCTS CO.
FAIRBURY, NEBR.

FOR SALE

2 Block, plain pallet machine. Vacumatic, in good condition complete with offbearer and attachments for 4", 8", 8" half, 12" and chimney block. Price $1200.00.

McKINLEY BLOCK COMPANY
63rd & Eastwick Avenue, Philadelphia 42, Pa.

CONCRETE BRICK COLORS
CEMENT COLORS
MORTAR COLORS
made by
BLUE RIDGE TALC CO., INC.
Henry, Virginia

FOR SALE

1—4½ yd. Jaeger mixer, mounted on 1949—KB8-F International Tandem Truck. Both truck and mixer bought new September 1949.

FLEGAL'S READY MIX CONCRETE
R. R. No. 1 Phone 155
ANGOLA, INDIANA

FOR SALE

(1) Concrete pipe machine, 12"-60".
(2) Mixer & Skip.
First class condition.

BOX M-6 CONCRETE PRODUCTS
309 W. Jackson, Chicago 6

KEEP ABREAST

WITH

INDUSTRY TRENDS

THROUGH

ROCK PRODUCTS

FOR SALE

1 Model #9 Joltcrete block machine equipped with power carriage and height control with relineable attachment to make 7¾" x 7¾" x 15¾"—50% air space blocks.
3500 3¾" ZONAL Pressed Steel pallets
550 B-17—11¾" 58% air space cast iron pallets
700 9¾"—45% air space Pressed Steel pallets
Above equipment and pallets guaranteed to be 90% as good as new. Write or wire for prices.

Oakes Concrete Machinery Inc.
P O Box 35, Foulke Station
Richmond, Ind.

BUILD GOOD WILL

Advertising necessities for the block industry. Line Pins, Twigs, Modular Coursing Stick. Also the new Block Calculator and Wood Corner Block. All imprinted with your advertising. Complete catalog on request.

GERSON CO.
99 DEERING ROAD, MATTAPAN, MASS.

FOR SALE

1—used Go-Corp Jr. Block Machine, 2 years old, in excellent condition. Replacing with larger equipment. Complete with 4"-6"-8" attachments, and spare parts. 4"-6"-8"-10"-12" pallets.

HOLLAND MACHINERY COMPANY
Holland, Michigan

STOP *that* WATER

With FORMULA NO. 640

A clear liquid—7 different resins in a solvent which penetrates ½" or more into concrete, concrete blocks, stucco; seals, holds 1250 psf water pressure. Applies quickly—no mixing—no furring—no membranes—no cleanup. Use on forms—wood or concrete.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

2 YD. TRUCK MIXER BARGAINS

Jaeger 2HS on 1947 Dodge $850.00
Ransom 2HS on 1947 Mack $1100.00

BUILDERS RENTAL EQUIPMENT COMPANY
1240 McCook Ave. Dayton, Ohio

FOR SALE

2,000—8" Pressed Steel Pallets — 3 Core Regular — 45% Air Spaced.

ATLANTIC SUPPLY COMPANY
25 W. Highland Ave., Atlantic Highlands, N.J.
Telephone: Atlantic Highlands 1-0303

FOR SALE

One Stearns #9 Joltcrete Machine with offbearing hoist. 4"—8"—10" and 12" mould boxes and pallets. Also racks for this machine. All in good condition, ready for immediate use. Now in operation.

JOSEPH METZ & SON
8136 Ogden Avenue, Lyons, Illinois

UNBREAKABLE
PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

Automatic Universal Tamper. Good condition. Used four seasons. For an 8" modular pallet. Replacing with larger machine.
Kent Tamper—good condition.
Wanted: Good farm tile machine.

COLFAX BLOCK CO.
R. A. Benjamin Colfax, Illinois

WANTED

TO BUY
Modern Used Concrete Pipe Equipment.

TO EMPLOY
Concrete Pipe Superintendent.

Williams Construction Company Inc.
Box 145, Baltimore 20, Maryland

FOR SALE

1—No. 10 Gilson Pulverizer crush, cinders, lime stone, etc.
1—132 bbl. steel supply tank has seel'd door. Both in A-1 shape.

RADLOFF CONCRETE PRODUCTS
811 West Main Street
Waupun, Wisconsin

LOWER COST
PACKER-HEAD WINGS
Proved to last as long or longer — yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS

FOR SALE

1—16 Cu. Ft. Dunn Mixer and Hoist, without motor. This equipment has been overhauled, has new parts where needed. FOB Olean $975.
1—Electric Platform Moto-Truck. New battery. FOB our yard .....$350.

I. W. MILLER & SON, INC.
336 Coleman Street
Olean, N. Y.

FOR SALE

1—Used 18 cubic foot Dodson mixer. New arms and blades, 10 HP—220V—3 phase motor included.

DOLCH CONCRETE PIPE COMPANY
Box 2085, Dallas, Texas
Ph. JU-0579

WANTED

Jackson & Church Brick Machines, six or twelve pocket. Prices must be low. Contact:

W. F. COLE
3557 Shelmire Ave.
Philadelphia 36, Pa.

WANTED

42 Cubic Foot Mixer and Vertical Skip. Reply to

GREENVILLE CONCRETE PRODUCTS, INC.
P. O. Box 153, Greenville, Ohio

WANTED

25 to 30 foot Stearns Mixer with 15 H.P. motor.
25 to 30 foot Stearns Skip loader.
Hydraulic or Air offbearing hoist.
Advise location, price, and condition.

BOX M-11, CONCRETE PRODUCTS
309 W. Jackson Boulevard
Chicago 6, Illinois

ENGINEER — WANTED

Mid-Western Cement Plant is looking for an engineer experienced in concrete construction to travel as field service engineer. For complete details, write:

BOX M-10, ROCK PRODUCTS
309 W. Jackson Boulevard
Chicago 6, Illinois

designed . . .

. . . FOR CUBING AND LOADING BLOCKS

THAT'S RIGHT, the new Truck-Man Model 40, two ton, High Lift was designed from forks to engine, especially for handling blocks. It is not just another industrial truck with special forks.

BIG 7.50 x 15, 10 ply Road Lug pneumatics on the drive wheels and 6.00 x 9, 8 ply rib pneumatics give you plenty of traction and footing for yard work. The big Ford engine, for ample power, and the short, 72", turning radius for peak maneuverability, mean that the Truck-Man 40 will really do a job in curing kilns and plant as well.

HERE ARE THREE BIG REASONS WHY THE 40 IS EASY AND ECONOMICAL TO MAINTAIN, TOO:

1 RUGGED — The big Ford Industrial Engine, oversized clutch, heavy duty transmission and axles insure less maintenance.

2 ACCESSIBLE — The tilt cylinder is mounted above floor decking for easy adjustment or service. Clutch, transmission or axles are removed in minutes for bench repairs. No need to pull engine for work as head and oil pan are easily removed.

3 STANDARD FORD PARTS — Serviceable at any Ford garage, include: hydraulic brakes, engine, differential, clutch, drive axle, and wear parts of steering axle.

Write or check coupon and mail for catalog with complete details on the Model 40 and 8 other versatile Truck-Man trucks.

truck-man
Div. of The KNICKERBOCKER CO.
650 Liberty St., Jackson, Michigan

☐ Have Salesman Call
☐ Send Catalog and Further Information

Name _____
Title _____
Address _____
City _____ Zone ____ State _____

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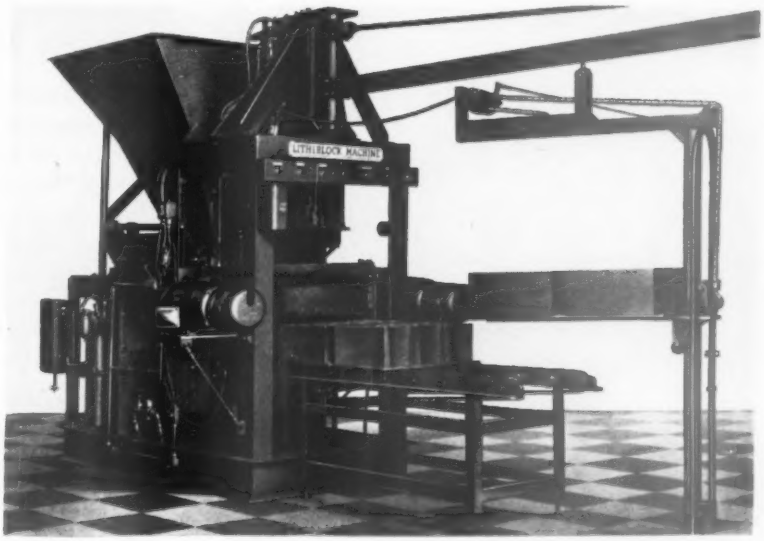
LITH-I-BLOCK gives you More in '54



get More value per dollar invested . . .

By using the compact, high-performance materials developed by modern engineering, Lith-I-Block Machines eliminate old-fashioned cams and gears. You get a higher level of performance and avoid the expensive bugaboo of big maintenance bills.

More production per man-hour . . .

Production records in plants just like yours *prove* that your cost-per-block is low when you install a Lith-I-Block. Total costs are consistently less than 2c per block and often run as low as 1¼c per block. Compare these figures with any machine on the market today!

More output, month after month . . .

The right combination of high-speed and rugged construction lets Lith-I-Block Machines produce at rated capacity or better over the long pull . . . not just on test runs! And that's the kind of performance that builds profits . . . the kind of performance that you can see in Lith-I-Block plants near you.

"We'll be here tomorrow to back up what we sell today."

WRITE for the names of nearby Lith-I-Block producers. Prove Lith-I-Block performance and value for yourself.

LITH-I-BLOCK MACHINES ARE MANUFACTURED BY THE LITH-I-BAR COMPANY HOLLAND MICHIGAN

Another Leader ★ IN THE PRODUCTS INDUSTRY PREFERS BESSER VIBRAPACS!

★ This is the 104th of a series of ads featuring leaders in the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

Officials of the Wausau Concrete Co. Front Row, left to right: P. F. Hettel, Plant Mgr., C. W. Parsons, Pres., L. A. Clark, Sales Mgr. Rear Row, left to right: L. C. Dehnel, Office Mgr., W. E. Shymanski, Plant Supt., R. H. Maleun, Traffic Mgr., T. K. Salick, Sales Dept.

Front Pallet Feed Vibrapac Produces "WausaW" Quality Block with a Minimum of Downtime!

The Wausau Concrete Company began operations in 1919, manufacturing concrete silo staves, culvert and sewer pipe. A number of years later, the company switched to concrete products for both residential and industrial structures.

The increasing demand for high-quality concrete masonry units, in 1950, paved the way for a plant modernization program which included the latest type Front Pallet Feed Vibrapac with electrical control panel. This machine now produces three kinds of modular block — concrete, cinder and Waylite.

Ask any member of this progressive Wausau firm what feature of the Automatic Vibrapac appeals to them the most, and they will frankly tell you it's the continuous operation, day-in and day-out, of this high production machine.

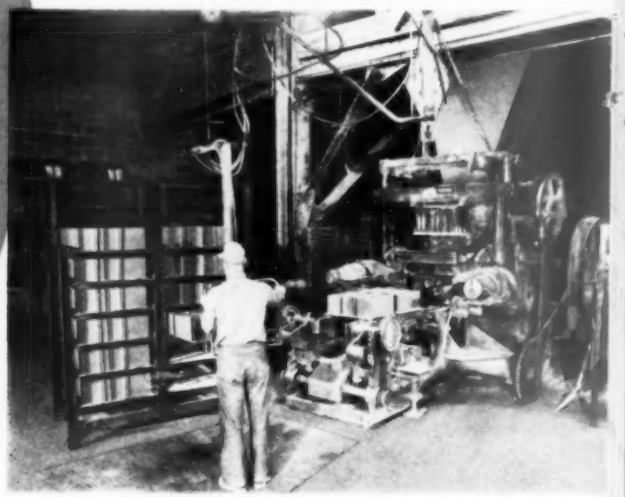
BESSER MANUFACTURING CO.

Complete Equipment for Concrete Products Plants

ALPENA, MICHIGAN, U. S. A.

Besser Front Pallet Feed Vibrapac installed in the Wausau plant. Fully automatic. One man removes finished block with power off-bearing hoist, and, with no lost motion, returns empty pallets to Vibrapac. No manual lifting. More than a million 8" x 8" x 16" units (or equivalent) are produced and sold annually, using the catchy slogan:

"WausaW Concrete for Permanence"



BESSER

BATCH MIXERS · SKIP LOADERS · BLOCK & BRICK CUBERS · SUPER VIBRAPAC · SINTERING PLANTS · ACROW CENTERS · ROOF TILE MACHINE

A 7552-1PB-C

An unbeatable pyrometer for any range between −300° and +2800°F.

DYNALOG* ...the electronic potentiometer that has no slidewire

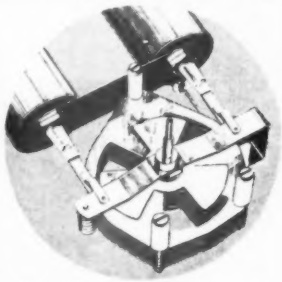
- **no battery to standardize**
- **no gears, no belts, no high-speed reversing motors**
- **no wear — no dead space**

TOPS IN SIMPLICITY, unequalled in sensitivity and speed of response, the Dynalog Potentiometer gives you unerring temperature measurement for any range up to 2800°F. . . . with a sustained accuracy of ¼ of 1% of scale.

Dynalog design eliminates slidewire and other parts that wear and cause dead space...practically eliminates maintenance.

Full scale pen travel in 3 seconds! Controlling models available with all types of Foxboro pneumatic and electric mechanisms.

Multi-Record Dynalog provides color-coded records of up to 6 points at 6 second intervals. For the full story, write for Bulletin 427-1.



No troublesome slidewire here! Instead, just a simple variable capacitor that gives the higher accuracy and friction-free operation of stepless balancing.

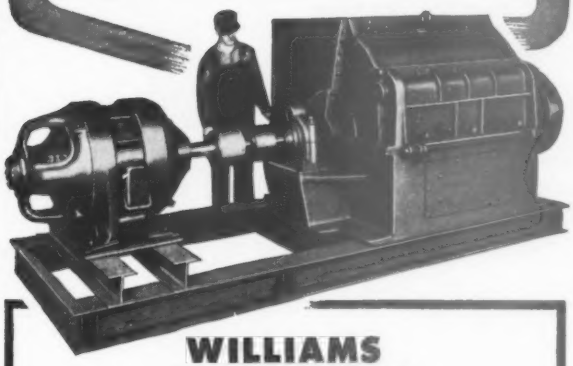
*Reg. U. S. Pat. Off.

THE FOXBORO COMPANY, 302 NORFOLK ST., FOXBORO, MASS., U.S.A.

FOXBORO POTENTIOMETERS

FACTORIES IN THE UNITED STATES, CANADA, AND ENGLAND

Only One Operation To Crush 6" Stone To Agstone Or Smaller!



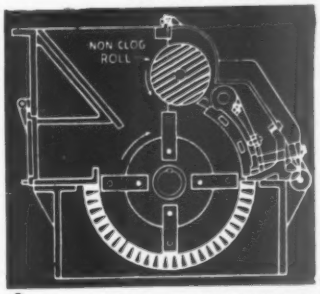
WILLIAMS SECONDARY HAMMER MILLS

For speed and stepped-up output in reducing rock of 6" size to agstone — or down to 20 mesh if required — Williams secondary hammer mills are in a class by themselves! Capacities range up to 75 tons per hour. Hundreds of installations have proved them outstanding profit-makers!

Extremely heavy rib-reinforced construction — manganese steel liners and breaker plates — easy adjustment to compensate for wear — double duty hammers — metal trap for tramp iron — instant access for service — these and many other features make the low cost Williams Hammer Mills top paying investments!

Many Sizes For Any Requirement

WRITE FOR CATALOG



NON-CLOG ROLL MECHANISM

The best way to handle wet, sticky clay or shale direct from pit for quick grinding without clogging. Roll is attached to hopper opening. Can be driven off main pulverizer shaft if desired.

OTHER WILLIAMS EQUIPMENT

ROLLER AND IMPACT MILLS with Air Separation for grinding to 325 mesh or finer . . . HELIX-SEAL MILLS for dustless or wet grinding . . . DRYER MILLS . . . AIR SEPARATORS . . . VIBRATING SCREENS . . . COMPLETE "PACKAGED" PLANTS ready to install.

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
800 ST. LOUIS AVE. ST. LOUIS 6, MO.

WILLIAMS
CRUSHERS GRINDERS SHREDDERS
OLDEST AND LARGEST MANUFACTURER OF HAMMER MILLS IN THE WORLD

HETHERINGTON & BERNER

DREDGING PUMPS

performance-proven on the toughest jobs

H&B ESTABLISHED 1887

Hetherington & Berner sand and gravel pumps are available in two general types: *STANDARD*, (4", 6" and 8" sizes) with semi-steel parts, for ordinary working conditions and moderate heads; and *DREADNAUGHT*, (6", 8", 10", 12" and 15" sizes) with manganese steel parts, for heavy duty jobs with stringent head conditions.

Write for Bulletin DP-147.

HETHERINGTON & BERNER INC.

755 Kentucky Ave. Indianapolis 7, Indiana

AUTO VORTEX CLASSIFIERS ••••

OFFER ON-THE-JOB PROOF OF VERSATILITY!

Whether a simple coarse classification is required, a series of classifications for blending, or the recovery of minus 200 mesh sand, the AUTO-VORTEX line of Classifiers offers the sharpest split, the most economical operation, and the most reliable automatic performance!

This performance is a matter of daily record in plants throughout the country.

Why not submit your classification problems to us? They'll be given our close and immediate attention . . . whether they call for the simplest single stage classification or a more complicated series of separations.

If you didn't get one at the NSGS Convention, write now for our illustrated brochure on Cone and Bowl type AUTO-VORTEX Classifiers!

CHARLES E. WOOD COMPANY

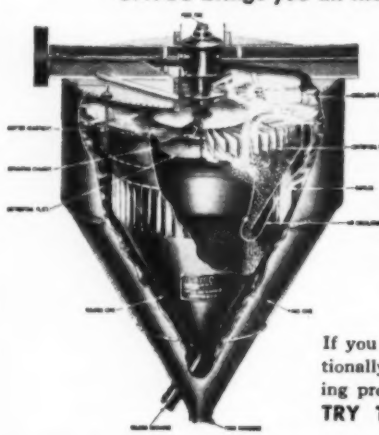
906 NORTH WATER ST. • MILWAUKEE 2, WISCONSIN

GAYCO CENTRIFUGAL SEPARATORS

GAYCO Separators, equipped with the adjustable centrifugal sizing fan — an exclusive GAYCO feature — make closer separations. Closer separations bring about higher production through efficient removal of the fines made by the mill. Closer separations bring about higher quality products by eliminating all undesirable oversize.

"TIMKEN BEARING EQUIPPED"

GAYCO brings you all these:



- Range 60 to 400 mesh
- Greater Capacity
- 25 to 30% greater production
- Cleaner Tailings
- Uniform Products
- Slow speed for slow wear
- Quick and easy adjustments

If you have an exceptionally hard separating problem, **TRY THE GAYCO.**

UNIVERSAL ROAD MACHINERY CO.

Rubert M. Gay-Division
Factory and Laboratory, Kingston, N.Y.
117 LIBERTY STREET NEW YORK 6, N. Y.
Canadian Representative: F. H. Hopkins & Co., Ltd.
8500 Decarie Blvd., Montreal, Que.

T.C. WOVEN WIRE SCREENS

ACCURATE • DURABLE • ECONOMICAL

The reliability of T.C. Alloy Screens has carried them into all parts of the world. Made in Standard and Special Weaves, with Square or Oblong Openings — from 10 mesh, .035" wire on up. Write today for Catalog No. 53.

TWIN CITY IRON & WIRE CO.

35 W. WATER STREET • ST. PAUL 1, MINNESOTA

Slurries... *handled at lower cost*

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

Buy WILFLEY for Cost-Saving Performance

A. R. WILFLEY & SONS, Inc.
Denver, Colo., U.S.A.
New York Office: 1775 Broadway, N.Y.C.

WILFLEY centrifugal PUMPS

WHERE TO BUY

CARLYLE

INDUSTRIAL RUBBER PRODUCTS FOR EVERY PURPOSE

IMMEDIATE DELIVERY OF CONVEYOR, ELEVATOR AND TRANSMISSION BELTING — FIRE, WATER, SUCTION, AIR, STEAM AND WELDING HOSE

WHY WAIT

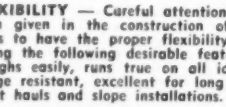
We have 8 to 48

RUBBER CONVEYOR BELTING

TOUGH COVERS—Heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly capable of withstanding the abrasive action of bulk materials. Properly vulcanized to the carcass to assure utmost performance, economically.

STRONG CARCASS — Constructed of finest quality 28 and 32 ounce tough cotton duck, properly treated and impregnated to avoid mildew from moisture and atmospheric conditions. Each ply thoroughly embedded in rubber to prevent ply separation.

FLEXIBILITY — Careful attention has been given in the construction of all belts to have the proper flexibility assuring the following desirable features; troughs easily, runs true on all idlers, gouge resistant, excellent for long and short hauls and slope installations.



Avoid delays in your production schedules!

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches.

Width	Ply	Thickness Top Cover	Thickness Bottom Cover	Type of Duck Carcass
8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
48"	8	1/8"	1/16"	32 Oz.

INQUIRE FOR SIZES NOT LISTED. ELEVATOR TRANSMISSION & V-BELTING ALSO IN STOCK

All our belting made by the leading belting manufacturers.

Write for Free Booklet on Installation, Care & Maintenance of Conveyor Belting.

SEND US YOUR INQUIRIES FOR OTHER RUBBER PRODUCTS.

CARLYLE RUBBER CO., Inc.
62-66 Park Place, New York 7, N. Y.
Phone: Digby 9-3810

1—Continuous bucket elevator 60' C. C. 12" x 8" x 8" Buckets. Faulk motor reducer. Totally enclosed motor 7½ h.p. 3/60/220-440, 24" Belt feeder.

1—Reliance roller screen 48" x 16' with extra screen cloth.
Screen section 48" x 10'.
Sand Jacket 72" x 10'.
Speed reducer, 10 H.P. totally enclosed motor.

Both items in good condition. Priced right for quick sale.

H. & H. SAND & GRAVEL
2303 Cadmus Rd., Adrian, Mich.
Phone 7214-J-3

CONVEYORS - IDLERS - BELTING
SCALES - SCREENS

Immediate shipment from stock

NEW TROUGHING IDLER CONVEYORS

We take our loss on our stock of short length belting and previous model idlers. You save as much as 50% by buying the BONDED CONVEYOR SPECIALS listed with conveyor belting in two pieces. **Belting** is 4 ply, 28 oz. duck, 1/8" top rubber cover and 1/32" bottom cover.

Belt Width	Length of Conveyor	List Price	Sale Price
18"	25'	$1229	$ 658
18"	45'	1839	960
18"	50'	2054	1043
18"	85'	3209	1581
24"	25'	1322	739
24"	45'	2062	1085
24"	60'	2617	1355
24"	100'	4097	2037
30"	25'	1421	806
30"	65'	3101	1617
30"	80'	3731	2295

Many other lengths and belt widths at bargain prices.

CONVEYOR BELTING

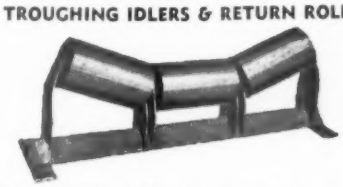
Heavy duty rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For boxes, bags and bulk materials. Troughs easily.

Famous brands at deep cut prices. Fresh Stock.

Width	Ply	Top Cover	Bottom Cover	Duck Carcass	Price
18"	4	1/8"	1/32"	28 oz.	$2.65/ft.
24"	4	1/8"	1/32"	28 oz.	3.40/ft.
30"	4	1/8"	1/32"	28 oz.	4.20/ft.

Additional widths and plies available at low prices. Write for free sample.

TROUGHING IDLERS & RETURN ROLLS



3-roll Troughing Idlers for these sizes:

16" belt	$17.25	30" belt	$19.50
18" belt	18.00	36" belt	20.25
24" belt	18.75	48" belt	21.75

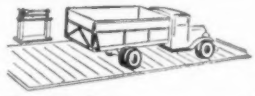
1-roll Return Idlers for these sizes:

16" belt	$6.75	30" belt	$8.25
18" belt	7.13	36" belt	8.75
24" belt	7.50	48" belt	10.25

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Rust proof ball races; maintenance is negligible.

MOTOR TRUCK SCALES

For stationary and portable applications. Scales have steel lever system complete with structural steel weighbridge. Capacities to 50 tons. Recording beams available.



20 Ton Truck Scales	$525.00
26 Ton Truck Scales	582.00
33 Ton Truck Scales	825.00

VIBRATING SCREENS

For sizing and separation of Rock, Sand, Gravel, Slag, Coal and many other uses. Shaft is mounted on self-aligning bearings and made in heavy duty eccentric shaft types; 1 to 5 decks, 3'x8' to 6'x14'. Others from 2'x4'. Wire cloth or plate included in price.

Priced from $431.00

WRITE FOR CATALOG AND PRICES

BONDED SCALE AND MACHINE CO.

Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders

128 BELLVIEW COLUMBUS 7, OHIO

PHONES: GArfield 2186; FR. 6-8898, Evenings

Special Crushers!!

Diamond 40x22 Roll Crusher. Diesel powered.
Cedar Rapids 40x30 Hammermill Twin GMC Diesel.
Jeffrey Flex-Tooth 42x36" hammermill.
Pennsylvania C-4-30 Reversible Hammermill.
Cedar Rapids 4033 Hammermill, Diesel powered.
Raymond No. 412 bowl pulverizer mill.
FARREL BACON 36" x 48" Jaw Crusher.
Traylor TY 4' with 200 hp. electric motor.

DREDGES

Ellicott 12"x10" new pump with new V-12 385 HP Diesel engine. Port. steel hull.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6".
8" Hydraulic. Diesel. On 32'x8' steel pontoons.
Amaco 10" Diesel power portable. Excellent.
6" portable Diesel complete with cutters, etc.
8" H-P twin Diesel drive. Complete.

CONCRETE PLANTS AND EQUIPMENT

Heltzel 1000 bbl. cement silo with elev. scales, etc.
Smith 56-S two yard tilting mixer. Complete.
Johnson 200 yd. 5 comparts. Complete large plant.
Noble CA 244-240 ton, 4 comparts. agg. Large cement silos.
Johnson 3 compt. 100 ton aggr. 400 bbls. cement bin with 24'x120' B-G aggr. conveyor.
Butler 250 bbls. cement B-K 100 ton 3 compt. agg.
NEW F-8 100 ton agg. bin 3 compt.
NEW F-8 400 bbl. cement bin complete.

CRUSHING PLANTS

Cedar Rapids Portable Super Tandem, excellent.
Pioneer 40-V. New 1946. Portable. Diesel power.
Pioneer WA-300, crushing, washing, screening.
Cedar Rapids AAA Port. Primary crusher 20x36.
Cedar Rapids 40x33 Port. Secondary, Diesel.
Cedar Rapids Portable Master tandem.

CRUSHERS

JAW: Acme 10x20, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 20x36. Diamond 24x36".
Cedar Rapids 10x20, 20x36, 25x40. Farrell 10x20, 13x30, 14x36, 18x36, 36x48. Buchanan 36x42.
Good Roads Reliance 15x30. Traylor 18x36, 24x36.
Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Champion 1030, 1040, 1236, 1530.
GYRATORY: Allis-Chalmers-McCully, 6", 7½", 8", 9", 12K, 20", 30", 42", 14". Newhouse, 24", 36".
Gyrasphere, 18", 28". Intercone Telsmith, Telsmith 5H, 10-B, 13-B, 16-B. Kennedy Van Saun 7, 19, 25½-S, 37. Traylor Ty 1'8", Ty 2'4", T-4½".
ROLL: Cedar Rapids 40x20. Diamond 40x22. Pioneer 30x18. Telsmith 24x16. Pioneer 30"x18". New Holland 24x16.
HAMMERMILL: Size 4 Williams Jumbo, Pennsylvania 8X2, 22x22. Cedar Rapids 20x33. Jeffrey 36x42, Jeffrey 36x24, 36x40.
BALL MILL: Hardinge 10'x48", K.V.S. 6'x8' Type M Air Swept J-H 6'x6', Hardinge Conical 6'x22". Colorado Iron Works 5'x6'; Marcy No. 64½. Hardinge conical 10'x36".
ROD MILL: March 2'x6', 3'x6'. Allis-Chalmers 4'x8'. Hardinge No. R 206. Marcy 8'x12', Hardinge 8'x22".
CONE: Symons 2' coarse bowl, 3' standard head.
TUBE MILL: Smidth 5½x20, K.V.S. 4'x7', Traylor 5'x22'.
DRIERS: Struthers-Wells 7'x64'; others 7'x20', 6'x80', 7'x70', 6'x40' and Cedar Rapids 60"x24'.

SHOVELS—CRANES—DRAGLINES

P&H 955 ALC Crane 2½ yds. 120' bm. 1951.
P&H 655-B, 1½ yd. Diesel Crane, 60' bm.
P&H 255-A, ¾ yd. Shovel-Crane, Diesel.
N-W 80-D 2½ yd. Dragline. Diesel. 100' boom.
N-W Model 6, 1½ yd. Diesel Shovel.
Buc-Erie 51-B Diesel Shovel. Practically new.
Northwest 80-D Diesel Shovel 2½ yd. Recond.
Lorain L-820 2-yd. Shovel-Drag-Crane 100' Bm.
Northwest 80-D Shovel-Drag. New 1948. Excellent.
Lima 1201, 2½ yd. Diesel Shovel.
Manitowoc 3500, 2¼-yd. High Lift Shovel.
Buc-Erie 54-B Diesel Shovel, 2¼-yd.
Lorain Model MC 414, Moto-Crane, 85' Bm. Exc.

SCREENS

Seco Double deck 6'x12'.
Kennedy-Van S. 4'x10' three deck.
Telsmith heavy duty washer 60"x13'.
Diamond 4'x10' three deck.
Lippman 4'x12' single deck.
Simplicity 4'x10' four deck.
Symons 4'x14' double deck.
Tyler 4'x10' two deck heavy duty, motor, Gen. Set.
Robbins Vibrex 3½ deck 4'x12' Model 48-144.

TRACTORS

2 Cat. D8 Angledozers with DDPCU rebuilt.
Int. TD-18A with B-E Bulldozer.
Int. TD-24 with B-E Cable Bulldozer.
All-Chal. HD19 Angledozer, Hydraulic.
All-Chal. HD7 with Gar Wood angledozer.
Allis-Chal. HD19 with hydraulic control angledozer.
Cat. D4 Tractavator with 1 yd. bucket, hydraulic

LOCOMOTIVES

45 Ton G.E. Diesel Elec. Loco., std. ga.
25 Ton Plymouth gas loco., std. ga.
Vulcan 20 ton standard gauge type 0-4-0 gas.
20 Ton Vulcan, gas, std. ga., rebuilt.
25 Ton Vulcan steam, std. ga., Side tank.
15 Ton Whitcomb 36" ga. gas.
Plymouth Model ULDA std. ga., 10 ton, Diesel.

DERRICKS

Steel 50 ton stiff leg derrick 90' boom. Complete.
American Terry 20 ton Guy Derrick, 100' boom.
Clyde 30 ton stiff leg 90' boom.
Guy Derrick, 15 tons, 115' mast, 105' boom.
American 25 ton stiff leg derrick, 90' boom.
Special 35 ton stiff leg derrick, 100' boom.
Nat'l Bridge 30 ton Guy Derrick, 100'.
American 30 ton stiff leg, 100' boom.

ASPHALT PLANTS

Madsen 4000# Port. Complete. Excellent.
B-Green Port. continu. 842 Mixer, 832 Dryer.
Overmander Monotrole Bit. Mixing Plant, T-34.
Model S-100 Simplicity, Diesel powered.
Hetherington-Berner Moto-Paver.
Barber-Greene Plant 848 Mixer, 836 Dryer Diesel.
Cummer 2500# Hot Mix Plant.
Monotrol complete plant. Three years old.

CABLEWAYS

Sauerman slack line 1¼ yd.; electric 90' mast.
Sauerman 1 yd. with 100 hp. electric motor, complete.
Sauerman 1 yd. with Wakesha gas hoist.

RICHARD P. WALSH CO.

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Cortland 7-0723 Cable: RICHWALSH

LIQUIDATION

COMPLETE LIME AND HYDRATE PLANTS

MILLTOWN, INDIANA

2—Vulcan 8' x 125' Rotary Kilns.
1—Raymond #402 Bowl Mill, 40 HP.
1—Allis Chalmers 7' x 60' Rotary Dryer.
1—Vulcan 4½' x 50' Rotary Dryer.
1—Allis Chalmers 48" x 36" Jaw Crusher.
2—Raymond #1 Pulverizers complete with 5'6" dia. Raymond double whizzer Separators, piping cyclones, fans.
1—Raymond 5 Roll high side Mill with double whizzer, Separator, piping, fan and motors.
1—Seco 4' x 10' double deck Screen.
2—Clyde #3 Hydrators, motor driven.
1—Apron Feeder 42" x 10', 10 HP motor.
1—Apron Feeder 18" x 11'6", 5 HP motor.
13—Bucket Elevators 20 to 70' cc 12" x 6" to 42" x 18" x 25" buckets.
10—Steel Bins 45 to 450 ton capacity.
300 feet of 9" and 12" Screw Conveyor.
Miscellaneous items including motors, structural steel, tanks, hoists, portable car loader, car puller.
Steel Building 70' x 247' x 45' high adaptable for re-erection.
All of the above available for immediate removal. Representative on premises.

AT OTHER LOCATIONS

2—Reeves 7' x 160' x 8½" Rotary Kilns.
2—Reeves 7' x 120' x 8½" Rotary Kilns.
2—Allis Chalmers 9' x 80' x 8½" Rotary Kilns.
1—Reeves 5' x 67' x 5/16" Rotary Dryer.
1—Cummer 5' x 40' x 3/8" Rotary Dryer.
1—F. L. Smidth 4' x 30' x 5/8" Rotary Kiln.
2—Cummer 4' x 20' x 5/16" Rotary Dryer.
2—Link Belt 3'10" x 16' Roto-Louvre Dryers.
5—Hardinge Mills 4½' x 16', 5' x 22", 6' x 22", 6' x 48", 10' x 48".
2—Raymond High Side Roller Mills, 3 and 4 roll.
6—Tyler Hummer Screens 3' x 5', 4' x 5', 4' x 7', 4' x 10', 5' x 10', 4' x 15'.
1—Seco 4' x 10' double deck screen.
1—Rogers 10" x 16" Jaw Crusher.

PARTIAL LIST
Send us your inquiries

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IMMEDIATE DELIVERY

A-C Model HD-14 Tractor, completely rebuilt and guaranteed, with cable Bulldozer, very reasonable.
A-C Model HD-5G Endloader, rebuilt and guaranteed.
A-C Model AD-3 Motor Patrol, rebuilt and guaranteed.
LeTourneau Super C Tournapull, reasonable.
Buckeye Model 402 Ditcher, rebuilt, fair price.
A-C Model B Wheel Tractor, rebuilt and guaranteed, with new mowing attachment, low price.
Schield Bantam Truck Crane, good condition, very reasonable.
A-C Model HD-10W Tractor, completely rebuilt and guaranteed, with either hydraulic or cable bulldozer, very reasonable.
Cedar Rapids Junior Tandem Gravel Plant with primary and secondary crushing units plus power, good condition. $11,000.00.
Caterpillar D-6 Tractor with bulldozer, less than 500 hours, reasonably priced.
A-C HD-9 Tractor with inside mounted bulldozer and winch, good condition, reasonably priced.
1—Caterpillar D-8 Tractor with Bulldozer.
1—Adams 414 Motor Patrol.
1—La Plante Choate 14-18 Scraper.
1—Caterpillar D-4 Endloader. Poor condition, very cheap.
1—International TD-9 Tractor with Bucyrus-Erie hydraulic Endloader, fair condition, cheap.
1—A-C Model HD-7W Tractor with Garwood hydraulic Bulldozer, reasonable.

ILLINOIS Road Equipment Co.
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BUCYRUS ERIE 22B Shovel & Dragline, with Cat. D318 diesel. Machine used as dragline only 1500 hrs. since new. Shovel front never used..$15,000.00
Rent $800 per mo. apply purchase.
ROGERS 2-UNIT PORT. Crushing & Screening Plants. Primary with 20x36 r.b. Jaw Crusher, apron feeder, GMC diesel power, underconveyor. Secondary with 36" hammermill, 671 GMC diesel power, 4x10 vib. screen. Both units mounted tandem axles, pneu. tires, gooseneck frame with dollies. Incl. elect. motors, drives, and generating plant. Good condition $25,000.00
TELSMITH 10x22 r.b. Double Roll Crusher with new bull gear. Good $3,000.00
UNIVERSAL 18x24 r.b. Jaw Primary Plant, with apron feeder, UD9 Internatl. diesel power unit, V-belt dr., mtd. rubber tires. Bargain $3,000.00
UNIVERSAL 10x16 Jaw Portable Plant, with power unit, delivery conveyor, on factory built self-propelled tractor chassis $1,750.00
UNIVERSAL 10x24 p.b. Jaw Crusher. Good $650.00
WISC. FDRY. 20x30 Jaw Crusher. A-1...$4,000.00
IOWA 18x24 p.b. Jaw Crusher, 20' el., 10x36 p.b. sec. Jaw Crusher, engine, screen. Good ..$3,000.00
GILSON #22 Hammermill with lime hammers and grates. A1 .....$650.00
SIMPLICITY 4x12 4-dk V. Screen. Excel. $2,000.00
SIMPLICITY 3x10 2-deck Screen. A1 .....$950.00
SIMPLICITY 4x10 3-deck Screen. 90% new $1850.00
UNIVERSAL 24"x30' Port. Conveyor, on pneu. tires with Wisc. engine, brand new. Complete $1750.00
HOUGH HLD 1 cy. diesel Payloader, hyd. trip. Good $2250.00
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1—5" LeCourtenay B2 centrifugal water pump—665 gpm, 43' head, 1750 rpm, with complete base, no motor $85.00

1—6" x 6'8" used sand discharge hose; good condition $35.00

1—New Pantograph type push-off device, manufactured by Clark Equipment—never used—new 1952 .....$690.00

100 New wooden oak 40" x 48" "Take it or leave it" pallets never used—cost $7.39 each $4.00

1—Westinghouse used induction motor with base—100 hp, 580 rpm, type MS, 3/60/440, serial #987904—with GE drum controller and starter including one 1948 100 hp GE type B, catalogue #8232638-64-T, magnetic starter $550.00

1—Westinghouse used 75 hp induction motor, 870 rpm, style #160835, serial #1320014—without base—in perfect condition including GE starter CR 1034 KI, size 2, catalogue #2019079 G 10—complete with relay—2 speed starter $775.00

1—General Electric circuit breaker 3/60/440, MI 1969132 G 2, P 3108, type HA 2, 100 hp capacity $50.00

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SOUTH RIVER SAND CO.
OLD BRIDGE, NEW JERSEY

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Koehring ¾ yd. #1A Crawler Crane & Dragline $2,250.00
Brownhoist ⅝ yd. Crawler Crane or Dragline 1,500.00
Koehring #301 Shovel, Crane, Dragline Combination 3,500.00
LeRoi #315 Portable Air Compressor, gas powered 3,000.00
Sullivan Wagon Drill Rig on rubber tires.. 800.00
18', 12', 9' and 6' 1¾ Drill Rods (some new) .....Half Price
Diesel 40 Caterpillar Tractor with LeTourneau dozer 2,500.00
Barber-Greene 18"x30' Portable Belt Conv. (on rubber) 1,250.00
Diamond Dual Action Portable Crushing and Screening Plant, complete with power .. 6,500.00
Cedar Rapids 15"x36" plain bearing Jaw Crusher 1,250.00
Gruendler 10"x20" Roller Bearing Jaw Crusher 800.00
All equipment listed in good working condition.

L. K. BANDY CONTR. CO.
Maquon, Illinois

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1½ yd. Koehring 605 Diesel Crane 140' bm. GM Diesel. Long Tracks.
30 ton Industrial Brownhoist Gas Locomotive Crane. 70' bm.
44 ton GE Diesel-Elec. Loco. new 1951.
25 ton GE Diesel-Elec. Loco. new 1950.
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30 ton Stiffleg Derrick & 3D Hoist.
750 CFM G-D Compr. 125 HP Motor.
130 HP Christian 2D Diesel Hoist.

Mississippi Valley Equipment Co.
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PENNSYLVANIA DRILLING COMPANY
Pittsburgh 20, Pa.

FOR SALE

Telsmith Sand Drag 48" x 24' tank size. 48 yds. per hr. 1,150 gal. per minute. Cheap, good shape.

PRINCE GEORGE SAND & GRAVEL CO.
Laurel, Maryland

"READY-MIX TRUCKS FOR SALE"

1—2 yd. Smith Mixer, Waukesha engine power, mounted on a 1948 International Single axle, recently repainted, good condition.
1—2 yd. Rex Mixer, Waukesha engine power, mounted on a 1948 International single axle, good condition, repainted.
1—3 yd. Smith Mixer powered with Continental Engine, mounted on International K-8F, tandem rear axles, repainted.

All priced right, ready to go. **FREDERICK G. SMITH & CO., Freeport, Illinois**

ALSO SEE READY-MIXED CONCRETE AND CONCRETE PRODUCTS EQUIPMENT
WHERE TO BUY ADVERTISING IN CONCRETE PRODUCTS SECTION

BELT CONVEYORS:
1—42" x 600 ft.
1—24" x 1100 ft.
1—24" x 114 ft.
1—24" x 232 ft.
All the above complete with belt, motors, drive and structural steel supports.

LOCOMOTIVES: 2—65 ton, diesel electric, standard gauge, 0-4-4-0, in guaranteed condition. For sale or rent.

LOCOMOTIVE CRANE: Link Belt 25 ton, standard railroad gauge, gasoline powered, air brakes, cast steel trucks, bucket handling, with or without 1¼ yd. clam shell bucket. For sale or rent. Located Minn.

TRUCKS: Euclid 27FD, 15 ton, End Dump with Cummins motors.

BATCH & MIXING PLANTS: One with 55 yd. cap., 2 yd. mixer, etc. One 200 ton with one or two Koehring 2 yd. mixers. Both plants complete with all auxiliary equipment. Photos and drawings available.

MINE HOISTS: Single and double drum 100 to 1500 H.P. with all electrical equipment. Complete specifications, drawings and photos available.

JAW CRUSHERS: Traylor 42" x 48", Universal 30" x 12", NEW, UNUSED; Allis Chalmers 18" x 30".

CLASSIFIERS: 4—Akins 54" x 34 ft. and four Wemco 78" x 28½ ft., Simplex, double pitch, weir type, with 220/440 volt syncrogear motors and lifting device. Four located Nevada. NEW condition.

PULVERIZERS: Hardinge steel lined conical Ball Mills, complete with motors and auxiliary equipment for dry grinding, sizes 5' x 22", 10' x 48". Marcy Rod Mill size 8' x 12', center peripheral discharge.

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3800 Ft. Inger. Rand 635 HP 2300
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3070 Ft. Chgo. Pneu. 500 HP 2300
1888 Ft. Chgo. Pneu. 350 HP 2300
1098 Ft. Inger. Rand 175 HP 440
781 Ft. Chgo. Pneu. 125 HP 220/440

LOCOMOTIVES
5—44 Ton G.E. Diesel electric.
1—25 Ton G.E. Diesel electric.
1—10 Ton Davenport Gasoline.
1— 6 Ton Brookville diesel.

25 TON DERRICKS
1—Model E Wiley—60 ft. Boom, steel stiff leg Derrick.

5 NEW MERRICK WEIGHTOMETERS
Model E for 24", 30", 36", 42" Belt.

JAW CRUSHERS
10" x 7" Allis Chalmers Blake.
40" x 10" and 30" x 10" Good Roads Roller Bearing.
20 x 10, 30 x 13, 36 x 24 Farrel Blake.
30 x 42 Buchanan Blake.
42 x 48 Traylor Bulldog, Blake.
60 x 48 Power & Mining, Blake.

PRODUCTION CRUSHERS
2 Ft. Symons, standard, boarse bowl.
#636 Allis Chalmers hydrocone.
10" Allis Chalmers Superior McCully.

HAMMER MILLS
36" x 24" Jeffrey B-2.
36" x 36" Jeffrey B-3.
#6 XD Gruendler reversible.
SXT-11 Pennsylvania Thor.

PULVERIZERS
Hercules Junior 3 Roll Mill.
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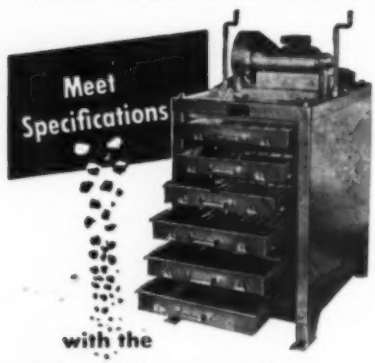

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"Controls are easy to operate, and not spread out all over the machine. Also, Caterpillar-built Tractors don't smother down like the others. When you reach for power, you've got it!" states Troy O. Swindler, left, supervisor for Everett & Clark, contractors, of Plattsburg, Mo. He is shown here with Howard E. Huey, operator of the Caterpillar D7 Tractor with No. 7S Bulldozer, at a rock quarry near Kearney, Mo. This machine stock-piles gravel, cleans the quarry floor, and on dirt stripping moves 200 yards of dirt per hour on a 75-foot haul.

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